

Chemical Week



Euromart — alive at last. Statistical profile of the new force in European trade . . . p. 20

Synthetic fiber sales: bright spot in textile chemicals' mixed market forecast . p. 35


◀ Behind the scenes at Ansul — where production workers help choose foremen . . p. 60

Hypertension drugs debut, bring new research pressure into \$50-million market . p. 71

Are silver polishes in trouble? 'No polish' stainless flatware is gaining fast p. 91

February 7, 1959

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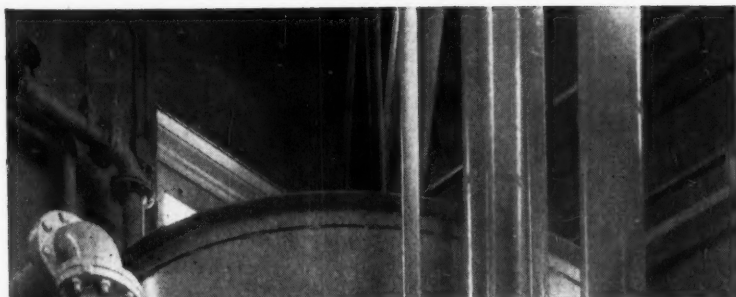
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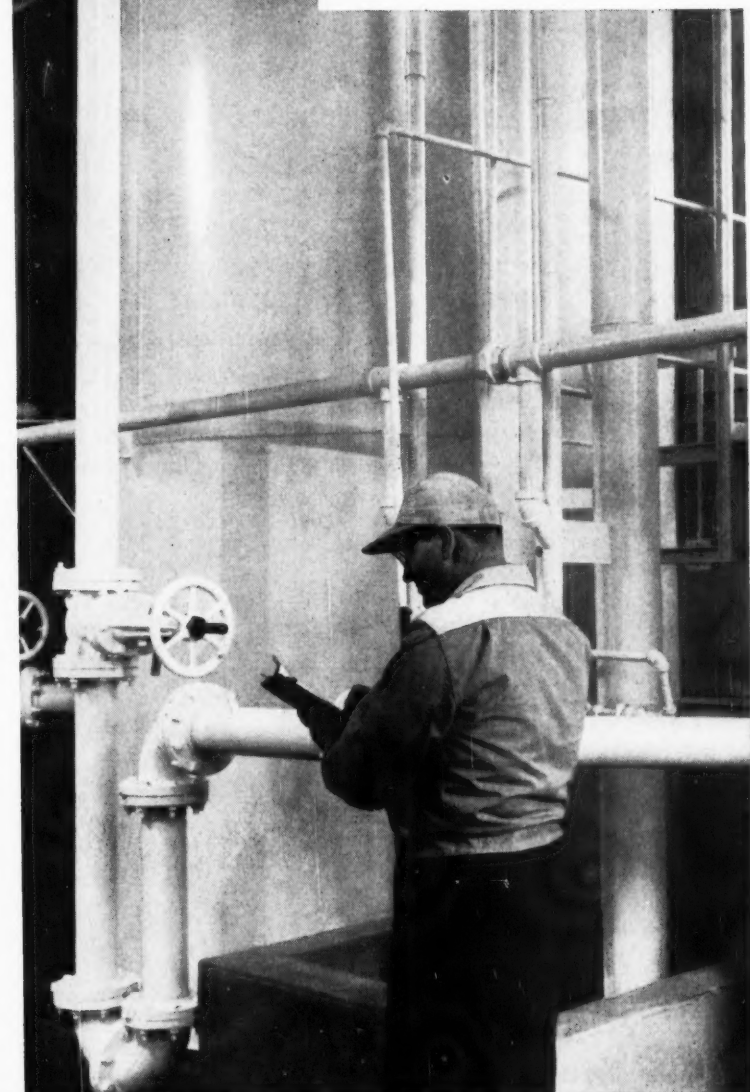
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TOP OF THE WEEK

FEBRUARY 7, 1959

- ▶ **Reichhold sales target: \$100 million/year; '59 sales prospect is \$83 million**p. 25
- ▶ **Ready for chemical shippers: 20,000-gal. rail tank cars.** But shippers, railroads differ on how to set ratesp. 45
- ▶ **Oxygen-enriched air improves catalyst regeneration.** Cities Service shows how to use it in fluidized cat-crackersp. 53
- ▶ **Making the CPI popular with the public is year-round job.** Chicago industry leaders discoverp. 88

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20 A new look at growth of Euromart chemical production and consumption and what it means to U.S. companies.

25 With eight plants now building, and prospects of \$83-million sales in '59, Reichhold lifts sights to \$100-million sales years.

26 New pressure for food-color laws: approaching expiration of permit of orange colorant Red No. 32. This week, Congress has two bills to consider.

26 Expansions of petrochemicals and fertilizers top the process industry's current spurt in Canada.

27 Latest shifts in phosphate production yield new criteria to judge TVA's program to develop fertilizer production and markets.

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Expected upsurge of synthetic fiber sales in '59 brightens textile chemicals picture, but chronic troubles persist in other areas.

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48 Co-ops blast new tax proposals.

48 Mississippi icing slows barge shipping.

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42,407 copies of this issue printed

Vol. 84
No. 6

Chemical Week is published weekly by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second-class postage paid at Philadelphia. Subscription: \$3/year in U.S.A. Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week. Please see page 7 for subscription requirements.

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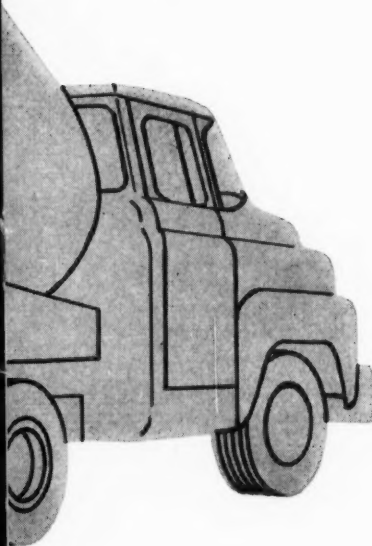
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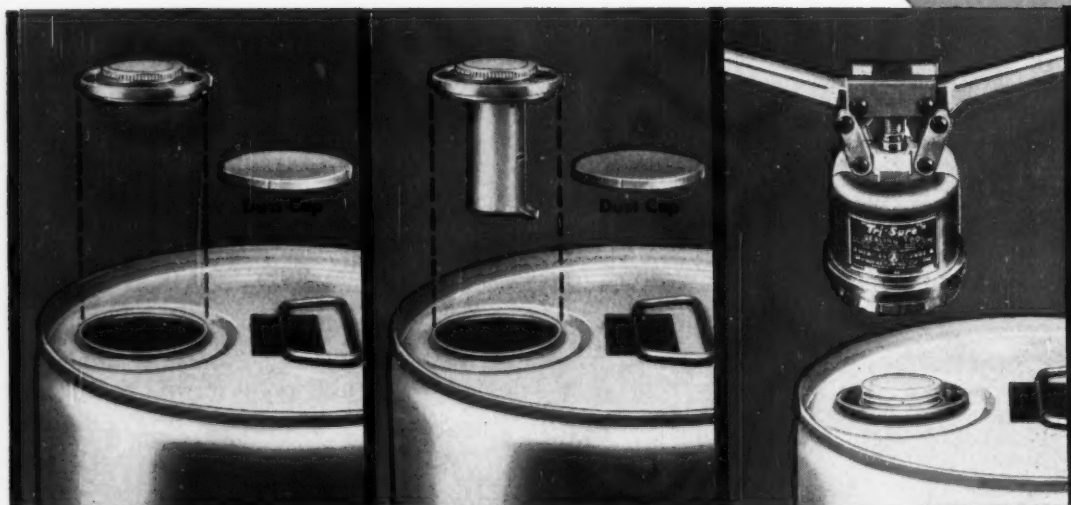


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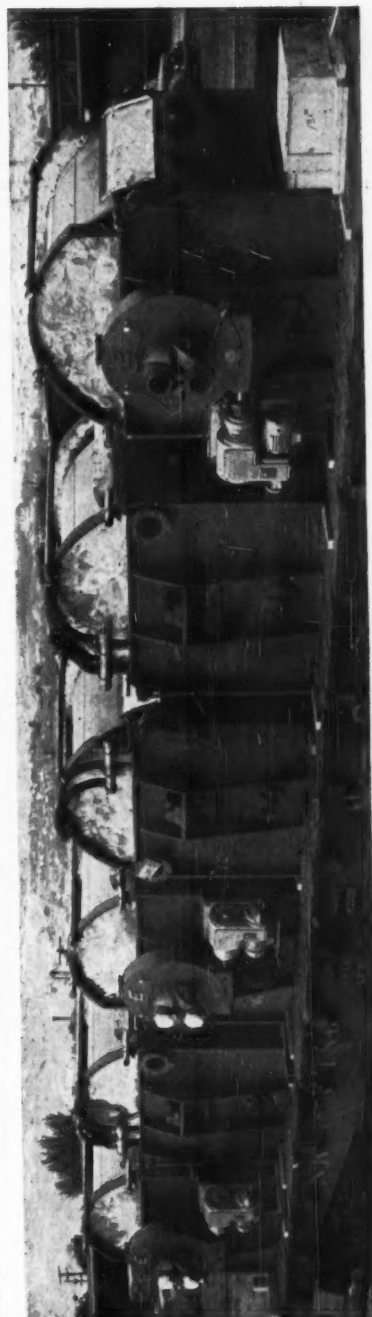
Frances Regan Reprints

FEBRUARY 7, 1959

Vol. 84, No. 6

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder, EXECUTIVE, EDITORIAL, CIRCULATION and ADVERTISING OFFICES: MCGRAW-HILL BUILDING, 330 West 42nd St., New York 36, N.Y. See panel below for directions regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, President, Publications Division; Harry L. Wadwell, Senior Vice-President; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Circulation Coordinator. Subscriptions to Chemical Week are solicited from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown in panel below. United States and United States possessions subscription rate for individuals in the field of the publication, \$3 per year; single copies, 35¢. Foreign subscription rates per year: Canada, \$4; other Western Hemisphere, \$15; all others, \$25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office. © Copyright 1959 by McGraw-Hill Publishing Co., Inc. All rights reserved. Unconditional Guarantee: the publisher, upon direct request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.

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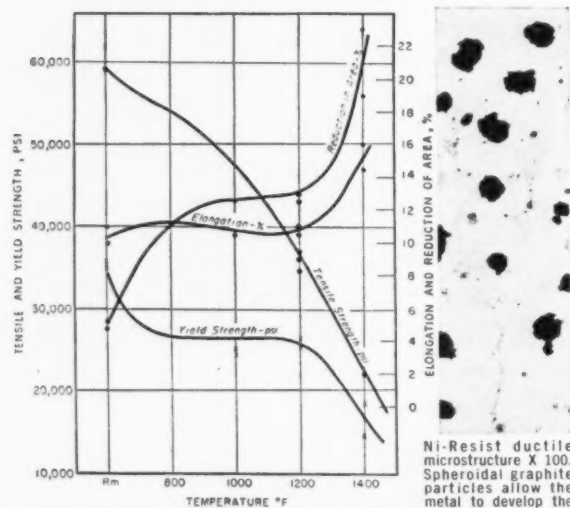
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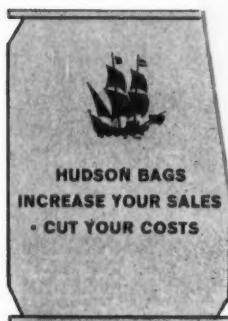
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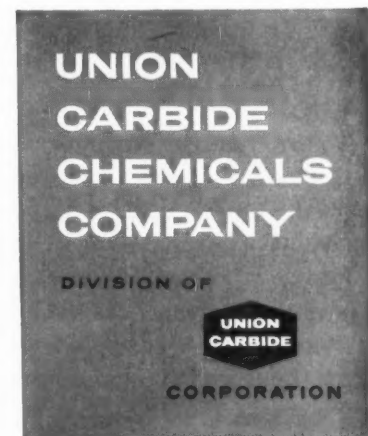
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Latex Paint Figures

TO THE EDITOR: We substantially agree with Mr. Zahrdt's comments (*CW*, Nov. 15, '58, p. 16) on the current distribution of the latex paint market. Our estimates of the share held by the various types of emulsions is approximately as follows: acrylics, 13%; vinyls, 28%; styrene-butadiene, 59%.

CHARLES E. BROOKES
Sales Manager, Organic Chemicals
Dewey and Almy Division
W. R. Grace & Co.
Cambridge, Mass.

Pollution Review

TO THE EDITOR: I enjoyed reading your "Viewpoint" review of the air pollution conference in the Nov. 29 issue of *CHEMICAL WEEK*.

C. FRED GURNHAM
Head, Dept. of Chemical Engineering
College of Engineering
Michigan State University
Lansing, Mich.

Amylose from Potatoes

TO THE EDITOR: We have read with much interest your article on amylose (*CW*, Dec. 13, '58, p. 113). While we appreciate the difficulties faced in presenting industry-wide coverage on this subject, there are several important points in this article that we feel should be corrected or clarified:

You indicated that our Superlose is the amylose fraction of normal corn. It is, however, the amylose fraction of potato starch.

Superlose has an amylose content of 95%, whereas high-amylose corn is 50-70% amylose. It is readily available in large volume . . . at 25¢ per pound.

In addition to pure amylose, we also have available chemical deriva-

tives of the new and interesting material. One of the more promising derivatives is hydroxyethyl amylose, which can be prepared and handled in the same way as regular starch, yet has the excellent film strength and film-forming properties of amylose.

PAUL KAPLAN
Technical Director
Stein, Hall & Co.
New York

'What'll It Do for Me?'

TO THE EDITOR: Shell Chemical's Amison Jonnard's remark to a gathering of market researchers—quoted in your excellent epoxy resin article (*CW*, Dec. 13, '58, p. 73)—that "if the industry could direct selling toward technical people, there would be no trouble moving epoxy resins in huge quantities. . . . Too many prospective buyers are more interested in price tag than performance," has made me recall a favorite remark of an instructor in Texaco's sales method course: "Technical men spend too much time talking about how good their product is, rather than what it will do for the prospect."

Until a salesman shows those who are responsible for the profits of a business how the performance of epoxy resins can better aid this major interest of theirs, epoxy resins will not displace currently used materials to any large extent.

JOHN W. PERLOFF
Texas-U.S. Chemical Co.
New York

More on Contract Research

TO THE EDITOR: Just a line to compliment you on Lauren Hitchcock's excellent report on contract research. . . . An article of this kind is most useful to all of us.

JOHAN BJORKSTEN
Bjorksten Research Laboratories, Inc.
Madison, Wis.

Full-Scale Operation

TO THE EDITOR: . . . your Dec. 6, '58, Technology Newsletter . . . states that the first urethane tire to go commercial may be the solid-cast urethane one for industrial use now being produced in pilot-plant quantities by Goodyear Tire & Rubber Co.

. . . We are a licensee of the Mobay

U.S.-RUSSIAN TRADE is again a subject of substantial concern in the wake of the U.S. visit by the Soviets' No. 2 man, Anastas Mikoyan. Note the points:

- Mikoyan, in meeting with businessmen, talked a good game on increasing trade. It was obvious that he wanted to work directly with the businessman, bypassing the government.

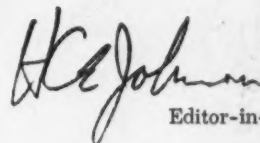
- He didn't really make an effort to broaden trade between our two countries. In the talks that really counted—the ones with government officials—he indicated that the Russians feel they've made the overtures on trade. It's time, he indicated, for the U.S. to extend credit and make tariff concessions.

- Russia very much prefers to keep on calling the U.S. uncooperative. It's much easier to say the other fellow doesn't want to play marbles than to actually play the game. (As Under Secretary of State Douglas Dillon said in a speech last week: "In truth, the only thing the Soviet Union needs to do if it really wishes to expand its trade is to begin trading.")

Look, then, at the question of selling chemical plants and process know-how to Russia. In view of the Russians' refusal to recognize the rights of an inventor to his patents or copyrights, those who oppose sale of plants and processes are right.

The Russians are major purchasers of technologically valuable government documents—U.S. patents, blueprints of atomic reactors, scientific reports—which have been of major help in modernization.

Why then haven't the Russians been able to borrow from our considerable chemical patent literature? Apparently, their technicians aren't well enough schooled in U.S. technique to do so without additional know-how. Should they be sold such know-how? Not now. Once they demonstrate good faith in recognizing the rights to patents and industrial property, it'll be worthwhile to reconsider.



Editor-in-Chief

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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OPINION

Chemical Co. and have been for a number of years. . . . We have been casting solid urethane tires for over two years. We now have press-on solid tires being tested that will take 15 tons each.

We produce tires for Moto-Truc, Yale & Towne, Automatic Transportation, Economy Engineering and Big Joe Manufacturing Co.

. . . We do not wish the public to think our manufacture of these tires is a pilot operation.

ROBERT E. BARRY
Sales Manager

Vulkollan Division
Albert Trostel Packings, Ltd.
Lake Geneva, Wis.

MEETINGS

Chemical Market Research Assn., meeting; theme: chemicals for the textile industry; Dinkler Plaza Hotel, Atlanta, Feb. 18-19.

National Chemical Credit Assn., sixth annual meeting, Sheraton Hotel, Philadelphia, Feb. 19.

Chemical Institute of Canada, Protective Coatings Subject Division, Toronto, Feb. 19; Montreal, Feb. 20.

Technical Assn. of the Pulp and Paper Industry, 44th annual meeting, Commodore Hotel, New York, Feb. 23-26.

American Pulp and Paper Assn., 82nd annual paper week, Waldorf-Astoria Hotel, New York, Feb. 26.

International Acetylene Assn., annual convention, Roosevelt Hotel, New Orleans, March 9-10.

Assn. of Consulting Chemists and Chemical Engineers, panel of six experts in open discussion; subject: Selling Professional Services; Shelburne Hotel, New York, March 10.

American Institute of Chemical Engineers and American Chemical Society, sixth annual joint technical meeting, King Edward Hotel, Beaumont, Tex., March 13.

Assn. of Corrosion Engineers, 1959 Corrosion Show and 15th annual national conference, Sherman Hotel, Chicago, March 16-20.

Society of Plastics Industry, Pacific Coast Section, 16th annual conference, Hotel del Coronado, San Diego, Calif., March 25-27.

American Institute of Chemical Engineers, Philadelphia-Wilmington section; theme: new advances in chemical engineering practice; University Museum, University of Pennsylvania campus, Philadelphia, March 31.



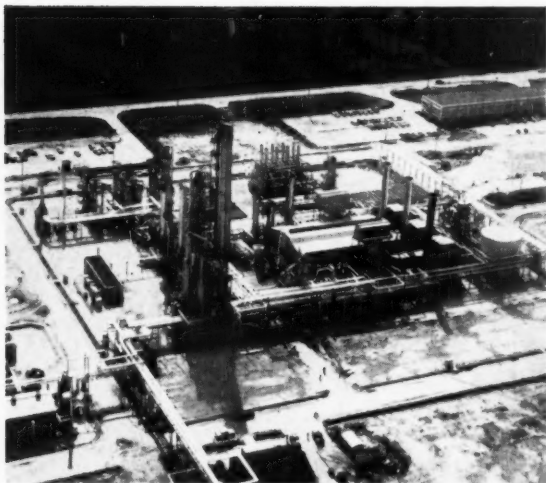
ENGINEERS AND CONSTRUCTORS FOR INDUSTRY

385 Madison Avenue

New York 17, N. Y.

200,000,000 LB. PER YEAR ETHYLENE PLANT FOR PETROLEUM CHEMICALS, INC. ON STREAM

**Lummus Designs, Engineers and Constructs
Plant to Pipeline 99.7+ Percent Ethylene**



Petroleum Chemicals, Inc. new ethylene plant at Lake Charles, Louisiana is now on stream. Initial ethylene product capacity is 600,000 lbs./per day but Lummus has designed the plant for rapid expansion to a rate of 900,000 lbs./per day. Ethylene will be produced in two grades — the highest grade is 99.7% assay and the other grade 98%. Co-products will be high assay propylene, a butane-butylene fraction and aromatic distillate. Operations have been marked by continuous production of specification high assay ethylene under widely varying rates and feed stock compositions.

The plant incorporates a new ethylene separation process developed by The Lummus Company which provides high separation efficiencies and unusual flexibility and reliability. Feed gases for the ethylene plant are provided from three sources;

the nearby refineries of Cities Service and Continental Oil — by whom P.C.I. is jointly owned — and P.C.I.'s new ammonia plant. P.C.I.'s high assay ethylene is delivered via pipeline to customers at Orange, Texas. Part of the new plant's output feeds the adjacent Calcasieu Chemical Corporation's new ethylene oxide and glycol plant, also engineered and constructed by Lummus.

Ethylene is used in the manufacture of polyethylene plastics, anti-freezes, synthetic rubber products, tetraethyl lead and liquid detergents.

Cracking section of the plant features an improved Lummus heater which embodies years of research and development by Lummus' Oil Heater Division.

All major compressors in the Lummus designed low temperature fractionation unit are driven by three 12,500 HP gas turbines. Gas turbine exhaust serves as preheated air for three high pressure steam generators. High efficiency expanders provide low temperatures for maximum ethylene recovery.

This plant brings the total of Lummus designed ethylene plants to 14, with a combined capacity of over 1 billion pounds per year.

Lummus has designed, engineered and constructed over 800 plants for the process industries throughout the world in the last 50 years. Why not discuss your next project with a Lummus representative.

THE LUMMUS COMPANY, 385 Madison Avenue, New York 17, N. Y., Houston, Washington, D. C., Montreal, London, Paris, The Hague, Maracaibo. *Engineering Development Center:* Newark, N. J.

Visit The Lummus Exhibit, Fifth World Petroleum Congress Exposition, New York Coliseum, June 1-5, 1959

React Epoxies with Z6018 Silicone Intermediate for Superior Electrical Resins

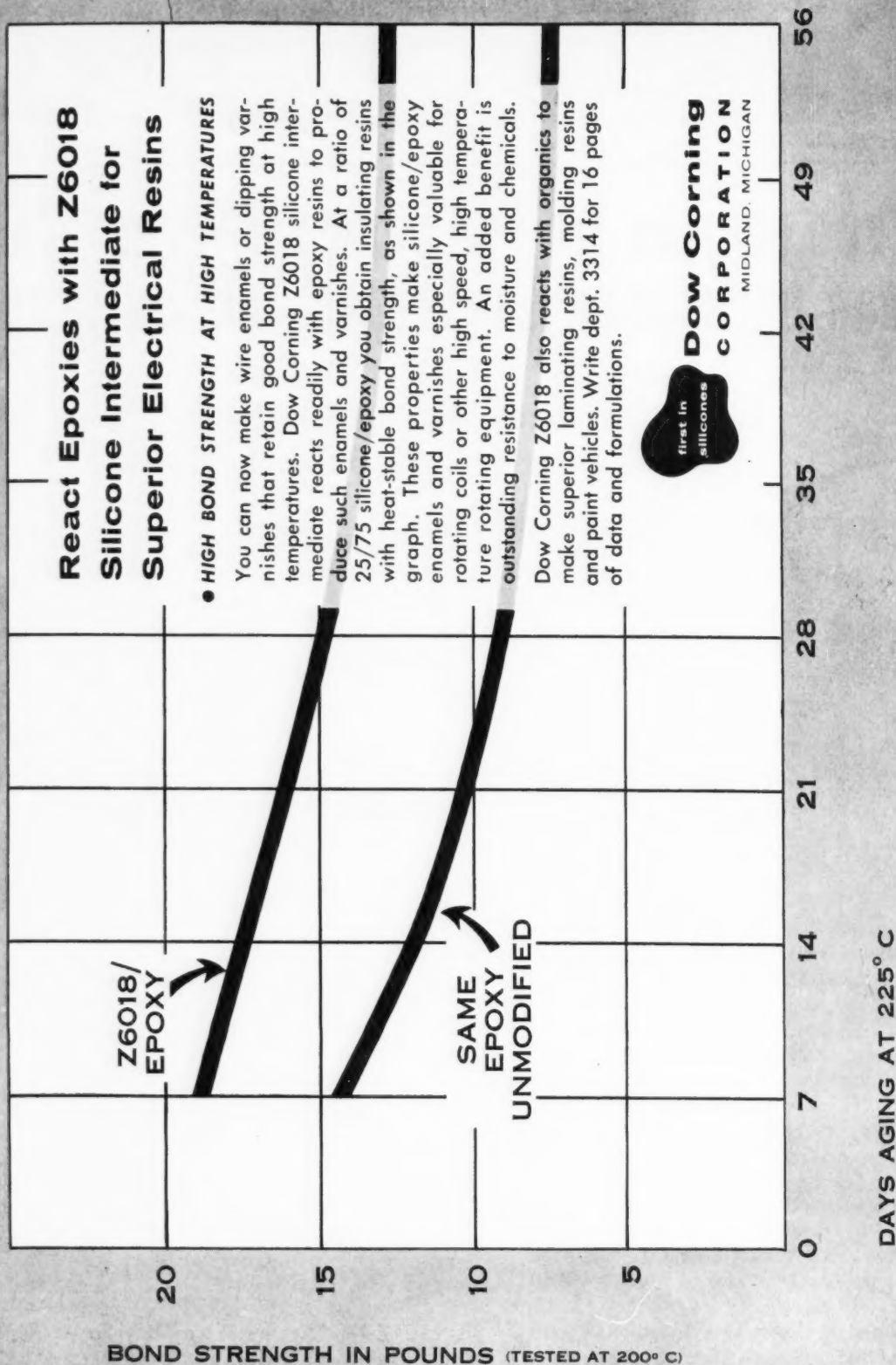
• HIGH BOND STRENGTH AT HIGH TEMPERATURES

You can now make wire enamels or dipping varnishes that retain good bond strength at high temperatures. Dow Corning Z6018 silicone intermediate reacts readily with epoxy resins to produce such enamels and varnishes. At a ratio of 25/75 silicone/epoxy you obtain insulating resins with heat-stable bond strength, as shown in the graph. These properties make silicone/epoxy enamels and varnishes especially valuable for rotating coils or other high speed, high temperature rotating equipment. An added benefit is outstanding resistance to moisture and chemicals.

Dow Corning Z6018 also reacts with organics to make superior laminating resins, molding resins and paint vehicles. Write dept. 3314 for 16 pages of data and formulations.



Dow Corning
CORPORATION
MIDLAND, MICHIGAN



Business Newsletter

CHEMICAL WEEK
February 7, 1959

Bulls still outnumber bears when it comes to business prospects for '59.

Enjoy President O. V. Tracy, for example, predicts chemical sales will hit \$25 billion in '59, compared with \$23.5 billion last year—with particularly sharp growth in overseas volumes.

Definitely in the optimists' camp is Allied Chemical. Its National Aniline Division reports recall of 200 more workers at Buffalo, N. Y., following a general boost in orders since last fall. Allied is also encouraged by pickups at its Semet-Solvay and General Chemical Division plants near Buffalo.

And word of improving business is scattered through most of the earnings statements issued last week:

Air Reduction finished the year with fourth-quarter sales and earnings up 7.6% and 12%, respectively, over third-quarter levels; but still fell short of its '57 peaks. Net income in '58 was \$13.35 million, off 16.1% from '57 earnings (excluding nonrecurring profit); and '58 sales were \$175.3 million, down 7.7% from '57.

Allied Chemical also calls the last three months of '58 its best quarter of the year; net income was 34% higher than in the July-September period and 3% better than in the fourth quarter of '57. For '58 as a whole, Allied's \$635.5-million sales and \$33.8-million earnings were down 7% and 22%, respectively, from '57 figures.

Canadian Industries Ltd. sales declined about 1%—partly because of a last-quarter strike at the refinery of a major customer—to \$140.8 million; but net income slid 40.2%, to \$5.2 million.

Chemstrand reports that business in the last half of '58 was the company's best ever. Twelve-month domestic sales were up 16.8%, to \$170.6 million; '58 earnings dipped 4.3%, to \$19.2 million.

Du Pont of Canada scored notable gains in both volume and income last year: sales climbed 12%, to \$81.7 million, and earnings rose 17%, to \$5.2 million.

Freeport Sulphur's '58 net income was up less than 1%, to \$13.1 million; but this—plus other factors—encouraged directors to raise dividends and recommend a three-for-one stock split.

Hercules Powder was more successful than most other diversified chemical and plastics producers in protecting earnings in '58. Sales dropped 4% from the company's '57 peak to \$236.5 million; net income declined 5%, to \$17.5 million.

Monsanto is another company to report that '58 "culminated in the best fourth quarter in the company's history." For the year as a whole,

Business Newsletter

(Continued)

Monsanto's U.S. and Canadian sales slipped 3.4%, to \$548 million; but worldwide sales rose nearly 1%, to \$714 million. Earnings of the domestic and Canadian organizations decreased 7.7% to \$34.6 million.

Rohm & Haas boosted sales nearly 1.5%, to \$176.6 million, last year but net income was down nearly 7%, to \$14.5 million.

Stauffer Chemical, on the other hand, achieved a 7% increase in net earnings while sales inched up 2.6%, to \$159.5 million. Looking for even better business this year, Stauffer directors are recommending a two-for-one split, to be voted on at the stockholders' meeting April 15.

Union Carbide also posted new sales and earnings records in the last half of '58. For the year as a whole, sales and income both were off by about 7% from '57 levels. Sales were \$1.3 billion; net income was \$125 million.

One warning that will tend to keep the lid on boom predictions:

Chemical stock dividends dropped sharply in December, bringing year-end totals to \$904.2 million vs. \$925.7 million in '57. With the exception of September and December, chemical dividends topped the '57 mark in every other month of the year.

American Agricultural Chemical plans a new chemical move.

It will build a "large" plant to make tripolyphosphate and tetrasodium pyrophosphate—detergent raw materials—in Carteret, N. J. The new unit will process phosphorus shipped up from the company's Florida reserves.

Three U.S. firms will build a \$50-million petrochemical complex

near Melbourne, Australia. Standard Vacuum's affiliate, Vacuum Oil Products Ltd., will put up an ethylene and butadiene plant. The ethylene will go to a 15-million-lbs./year Union Carbide polyethylene plant, slated to go onstream in early '61, and to a styrene monomer plant that will be built by Dow and C.S.R. Chemicals Pty. Ltd. Part of the styrene output and the butadiene will be fed into a planned GR-S rubber plant.

A fire and explosion ripped through Koppers' plant

at Follansbee, W. Va., last weekend, leveling two chemical storage tanks, causing other damage totaling \$1.5 million.

The fire apparently started in a near-empty tank containing unrefined naphthalene and other coal-tar fractions, spread to a full tank nearby. No injuries were reported, although a full shift was on duty.

Tar Products Division Manager John Redmond praised the joint company-community disaster plan, saying it worked "beautifully." At press time, the plant was 80% back in operation with good prospects of normal operations within 10 days. Cause of the blast is still unknown.



The Shell chemicals listed below are used in the manufacture of many important drugs and cosmetics.

Take a closer look . . .

THIS portrait of a common garden flower, the petunia, shows how much more we may see in a familiar plant on close examination. Throughout the ages, flowers have been both an inspiration and challenge to scientists. Only recently have chemists succeeded in synthesizing pleasing perfumes that rival the fragrance of flowers.

Although the chemicals listed at the right are familiar, it may pay you to take a *closer* look at them. They are available in quantities from a drum to a tank car.

Write your nearest Shell Chemical district office for samples and technical literature.

Acetone
Ethyl Alcohol
Glycerine
Hydrogen Peroxide
Ionol® CP
Antioxidant
Isopropyl Alcohol
Methyl Isobutyl
Carbinol
Methyl Isobutyl
Ketone
Tertiary Butyl
Alcohol

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Chemical Week

Feb. 7, 1959



Newly launched six-nation 'Common Market' (Euromart) emerges as most potent trade force in OEEC lineup.

Filling Out Europe's Trade Puzzle

In anticipation of the day when the European "Common Market" passes from theory to reality, U.S. chemical producers have been gathering bits of information on the impending threat to their foreign trade. This week, with the appearance of the Organization for European Economic Cooperation report on Europe's chemical industry, the U. S. chemical community has an uncommon over-all picture of its new collective competition — still in its infancy, but very much alive.

The OEEC report — based on 1957 data — embraces the six Common Market (Euromart) countries (France, Italy, Germany, the Netherlands, Belgium, Luxembourg) and 11 other OEEC member nations.*

*Austria, Denmark, Greece, Ireland, Iceland, Norway, Portugal, Sweden, Switzerland, Turkey, United Kingdom.

On this, and the following four pages, the OEEC figures are updated with reports from CW's European news bureaus, and compared with U.S. data. Result: a record of western Europe's chemical growth — a guide to future European market opportunities for U.S. producers.

Delayed Action: The figures, of course, cannot reflect any impact made by the Common Market, which went into effect only last month.

First steps were a 10% tariff cut and a 20% import quota boost among the member nations; but no selective advantage will accrue from these moves, because the Euromart partners extended the concessions to the other members of the 37-nation General Agreement on Tariffs and Trade.

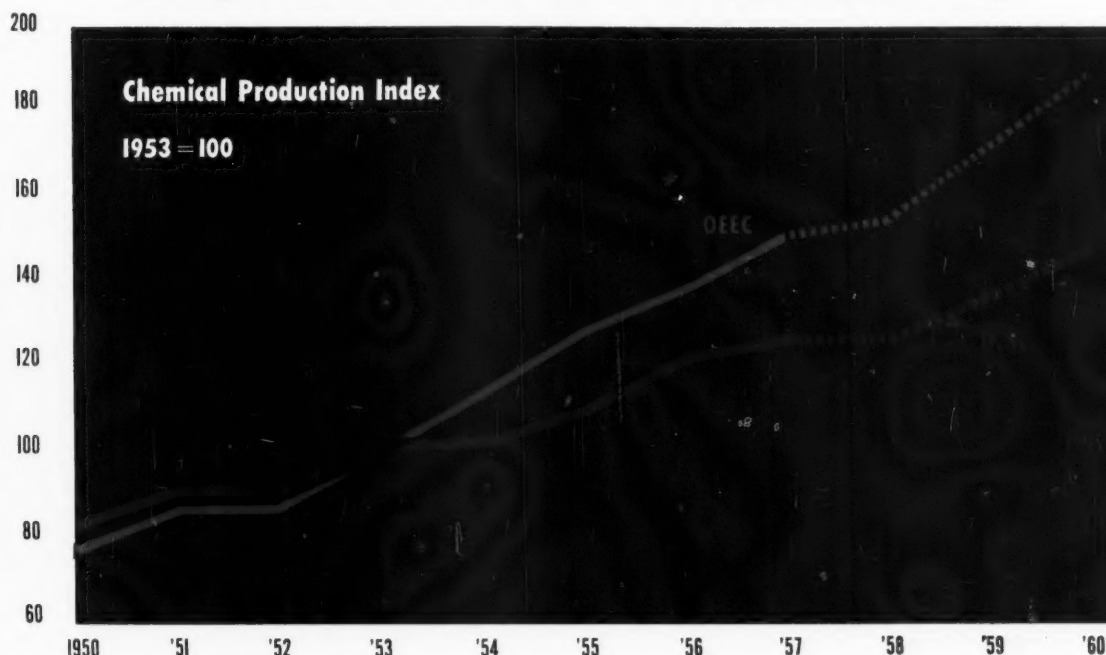
Impact of future stages may well

be blunted by broad tariff concessions likely to result from a planned GATT session in '60, and possibly by compromises with other OEEC nations. Spearheaded by England, the OEEC countries are pressing the Euromart faction to include them in its future concessions.

In any event, it will take 12 to 15 years for Euromart to take final shape — and at least a few years before even the early adjustments begin to significantly pinch trade with the U.S. or the rest of Europe.

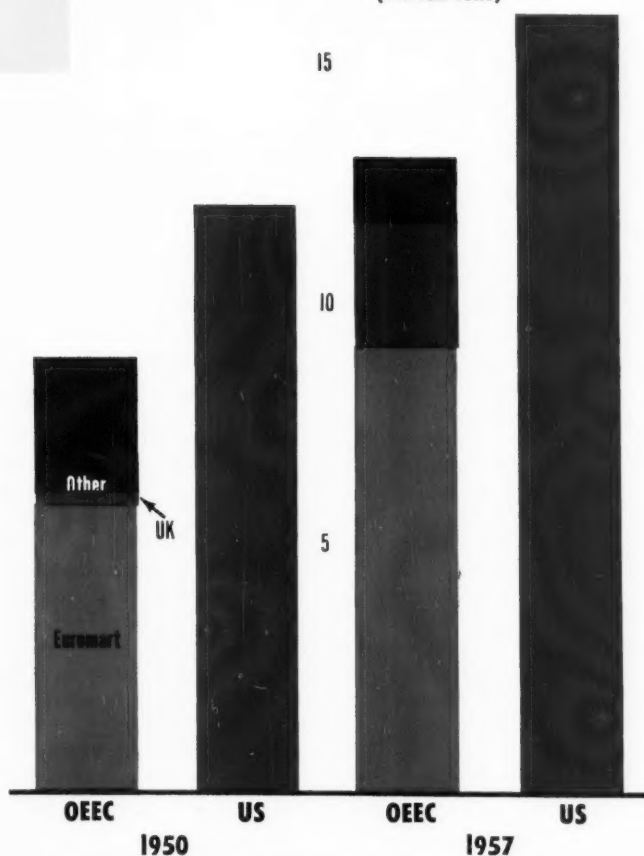
But indirect effects are already obvious. Producers in the Common Market area have already started modernizing equipment and sales organizations in preparation for the opening of new mass markets. Technical and financial agreements are springing up between producers in

Europe vs. U.S.—How the Markets Measure Up



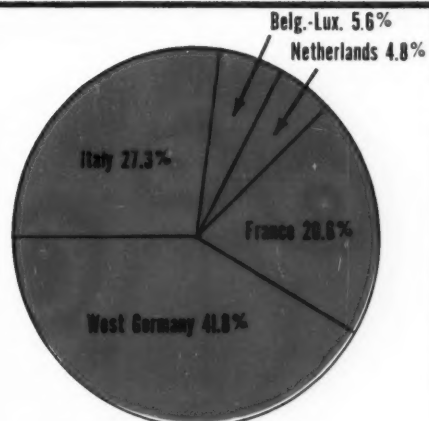
OEEC figures do not include animal and vegetable oil products
Sources: OEEC, CW

Sulfuric Acid Output (million tons)

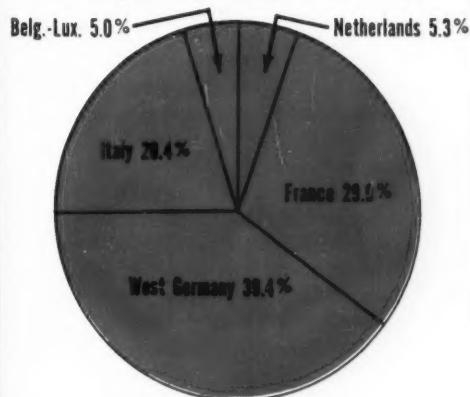


Sources: Organization for European Economic Cooperation; U. S. Commerce Dept.

Euromart's Chemical Split

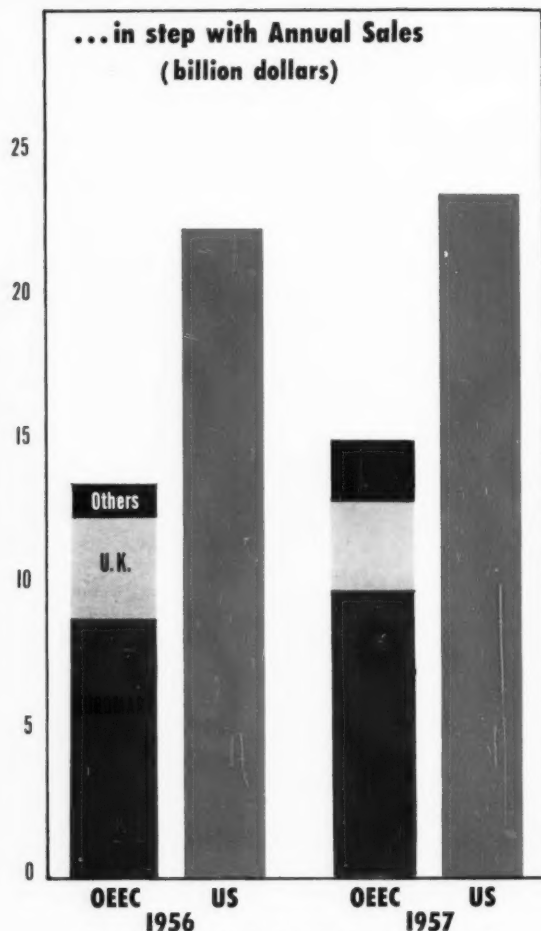
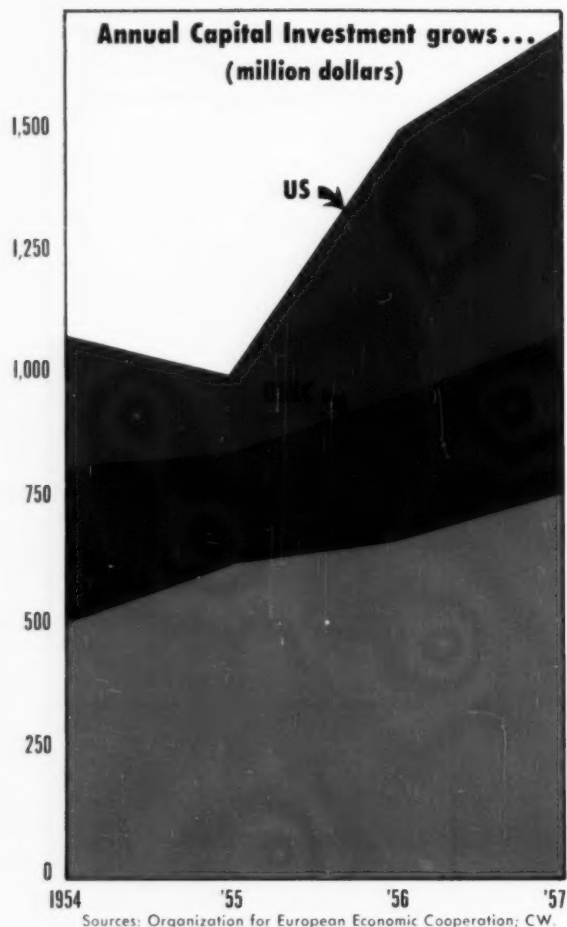


'57 Capital Spending: \$754 million



'57 Sales: \$10 billion

Over-all chemical expansion sparked by . . .



different areas of "The Six." And U.S. producers, with an eye toward the eventual loss of European export markets, are almost daily setting up shop in the Common Market through licensing agreements, investments, and by building their own plants.

Parting Ways: This activity is partly responsible for the acceleration of chemical industry growth already evident in the Euromart countries, compared with growth in the rest of western Europe.

Between '54 and '57, rate of capital investment in the chemical industries rose 49% in the Common Market countries — to \$754 million — compared with the total OEEC rise of 34%, to \$1.1 billion. (U.S.

investment rate rose 53%, to \$1.7 billion.) Sales of chemicals and allied products* rose 11% in the Common Market "Six" in '57, 10% in the other OEEC states. And employment increased 3% in Euromart, compared with the 17-nation average rise of 1%.

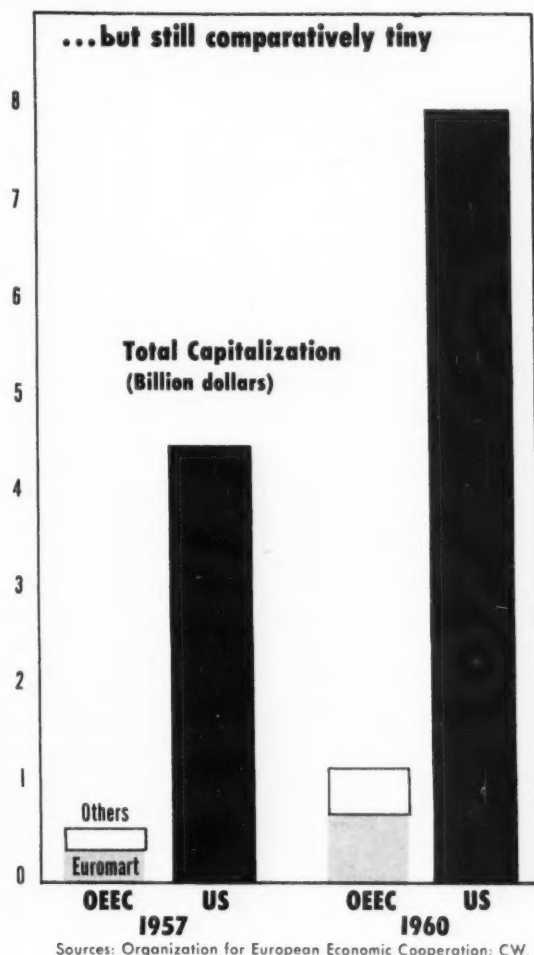
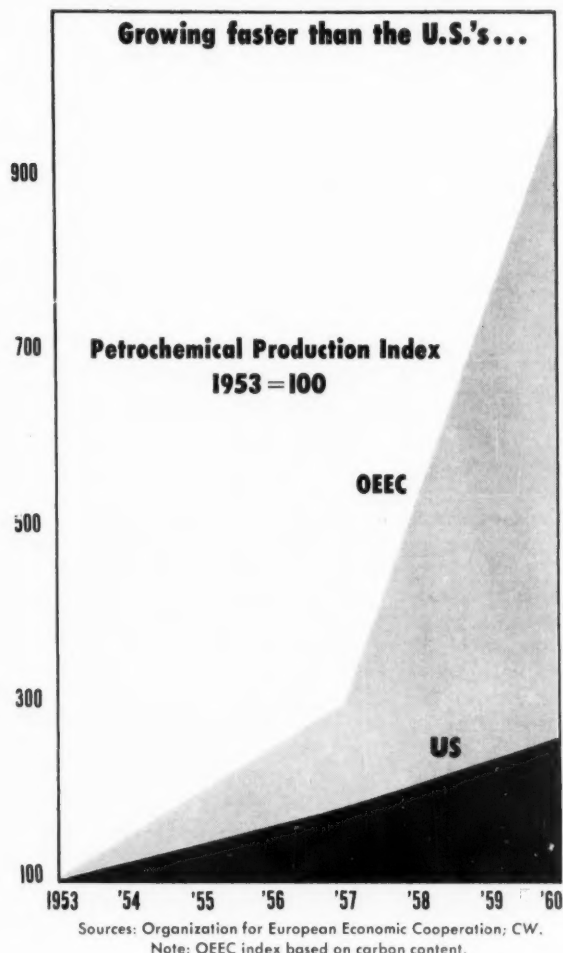
Heartland: As a group, the Common Market nations already dominate the European chemical industry. Sales of the six members in '57 totaled almost \$10 billion — 66% of the total \$15.2 billion chalked up by all the OEEC members. One indication of Euromart's chemical sales potential: a comparison of its \$10 billion

*OEEC chemical industry figures do not include animal and vegetable oil products. U. S. figures for chemicals and allied products do.

sales with the \$23.4 billion scored in '57 by U.S. chemical producers—the populations of the U.S. and the Euromart group of countries are roughly equal.

Generally, European chemical producers suffered a sales dip several months after the recession hit U.S. producers. The rebound was rapid, however, and '58 sales totals will probably show an increase over '57. European output rose 10% in '57 over '56, compared with a 4% rise in the U.S. Leading the gains: France, up 16%; Germany, up 12%; Austria, up 11%. (These and all other comparisons between European countries are approximate because of inconsistencies in reporting.)

... Rapid rise of Europe's petrochemical industry



Later in Recession, Productivity: During the first half of '58, OEEC chemical production rose 6% over first-half '56, while in the U.S., output dipped 3%. But in second-half '58, European chemical production also dipped, although reports from CW's European bureaus indicate total '58 output should still be some 3% above the '57 total. Through '60, an average 10%/year rise in output seems likely. After that, Common Market developments may cause an even sharper rise within "The Six."

Productivity within OEEC is rising, and its chemical labor force remained steady in '57 despite the 10% rise in output. But compared to the U.S., productivity is still low. The labor

force of OEEC's chemical industry totaled about 1.4 million in '57, compared with 833,000 employed by the much larger U.S. industry.

Only about 30% of Europe's chemical industry personnel were classed as administrative, clerical or technical, compared with 36% in the U.S.

Most OEEC countries are feeling a shortage of technical manpower, and have been expanding schools to meet demands which will become even more pressing as modernization is stepped up to meet the stiffer competitive conditions on the way.

Petrochemical Boom: The most sensational development in Europe's chemical industry is the fabulous petrochemical boom, that has seen

output triple between '53 and '57, and swell another 32% in '58. This is well on the way toward a '60 target of 2 million tons (carbon content), a rise of more than 200% over '57.

Between '56 and '57, the petrochemical industry's consumption of natural gas rose 41%, to 180,500 metric tons; petroleum, 30%, to 1.1 million tons; refinery gas, 30%, to 924,000 tons.

To pour out this flood of petrochemicals, European producers plan to spend almost \$650 million between '57 and the end of this year. Compared with the \$3.5 billion in capital outlays planned by U.S. producers for the same period, the European

growth rate is still modest. But it is probably enough to make Europe self-sufficient in petrochemicals.

Concentrated Production: Almost all of Europe's present and planned petrochemical production is within the Common Market (in France, Germany, Italy, the Netherlands), and the United Kingdom. Estimated production breakdown in '58: United Kingdom, 40%; West Germany, 20%; France, 17%; Italy, 16%; the Netherlands, 5%.

In France, output rose 60% in '57, and an estimated 77% in '58. By the end of '60, new investments totaling some \$211 million will quadruple the size of the industry. Products on tap: styrene-butadiene, butyl, and nitrile rubbers; ethylene oxide, acetylene, and derivatives; dodecylbenzene, propylene and derivatives.

In Germany, petrochemical investments increased by \$40 million in '56, another \$45 million in '57. A total of \$120 million more will be spent on plants coming onstream by the end of '60. Output increased by almost 24% in '57. Over the next two years, feedstocks used for petrochemicals are slated to triple. Pegged for expansion: styrene-butadiene rubber, polyethylene, ethyl alcohol, ethylene, glycol, propylene, detergents, solvents.

Italy's Output Doubling: In Italy, the new Anic synthetic rubber plant at Ravenna and Montecatini's polypropylene plant at Ferrara boosted petrochemical investment from \$51 million at the end of '56, to \$78 million at the end of '57. Output doubled between '56 and '57, almost doubled again in '58.

New plants already under construction will cost a total of \$110 million. Their products: polyethylene, ethylene oxide derivatives, styrene, isopropyl alcohol, polypropylene, propylene tetramer, alcohols, butadiene, polybutylene.

Petrochemical production in the Netherlands rose from 31,400 metric tons (carbon content) in '56, to 36,700 tons in '57, was slated to reach 44,700 tons in '58, double that by the end of '60. Total capital invested in petrochemical industry rose from \$13 million in '56, to \$16.5 million in '57. A polyethylene pilot plant has been operating more than a year, and Europe's first synthetic glycerine plant went onstream in May.

Planned expansion will center around base materials for synthetic detergents, and plasticizers and intermediates for synthetic rubber.

The United Kingdom's booming petrochemical industry doubled output between '56 and '58, when carbon content totaled an estimated 327,000 tons. Investments in '57 were about \$170 million, and another \$181 million is slated for investment by the end of '60. Included in expansion plans: S-B synthetic rubber, ethylene oxide and derivatives, polyolefins, raw materials for plasticizers, synthetic fibers, synthetic detergents.

Plastics Push: Along with the petrochemical boom, western Europe is scoring heavy gains in plastics production. Sales in '57 reached 1.4 million metric tons, a 19% gain over '56. Domestic (apparent) consumption rose from 600,400 metric tons in '53 to almost 1.4 million tons in '57. Within the Euromart countries, '57 sales were 927,500 metric tons; apparent consumption, 881,600 tons. U.S. plastic sales, by contrast, totaled about 1.7 million metric tons in '57. U.S. per capita plastics consumption is still about twice the rate of that in the Common Market countries.

In Germany, '57 sales totaled 564,000 tons in '57, a 20% boost over '56. Expansion in polyethylene and higher production of polystyrene, polyvinyl chloride and polyvinyl acetate helped boost thermoplastic sales 24%. Thermosetting-resin sales rose 19%; cellulose derivatives, 8%. Future German expansion is expected to hold steady, but the rate of increase may slacken.

Plastics Gains in U.K.: British producers racked up a 14% sales increase in '57, to 397,000 tons, compared with a 7% increase in '56. Polyvinyl chloride sales rose 36%, to 67,500 tons; polystyrene, 30%, to 31,600 tons; and polyethylene sales were up 24%.

French plastics producers are out to double sales between '57 and '61, with polyvinyl chloride taking the lead, followed by polystyrene, polyethylene, acrylic and methacrylic resins. In '57, as in '56, sales shot up 26%, to 163,000 tons. Biggest jump—30%—was made by cellulose derivatives (8,000 tons); but the thermoplastic polymers, with sales of 92,807 tons, are still far in the lead.

Italian plastic sales rose 15% in

'57, to 134,000 tons. Biggest gainers (22%, to 48,500 tons) were the thermosets, especially polyesters.

Other Gains: Other sectors of the OEEC countries' chemical industry are also showing healthy gains.

Nitrogen output rose 13% in '58, to 3.9 million tons, while sales increased 8%, to 2.78 million tons. Consumption is expected to rise 7%, this year and another 4% in '60.

Sulfur consumption is still far ahead of domestic output in the OEEC bloc. In '57 it was up 12%, to 1.2 million tons, while output was 580,000 tons, only 5% higher than '56 production.

The Common Market countries outstripped the rest of OEEC in output gains in paints, enamels and varnishes. The Euromart '57 total: 990,000 tons, up 8.4%, compared with the 11-nation gain of 6%, to 1.7 million tons.

Output of synthetic detergents in the OEEC area hit 940,000 tons in '57, 7% over the '56 level. But the rise is tapering off. In '56 the gain was 14%; in '55, 21%.

Close-up: Here is the picture in the major Euromart countries and the U.K.

In Germany, '58 chemical production was valued at about \$4.3 billion, a 4% rise over '57, compared with a 12% rise between '56 and '57. In the next two years, producers expect gains of 3-4%.

Brightest hope: plastics. Output hit 630,000 tons in '58, a 13.5% boost over '57. Synthetic fiber output (excluding cellulose) was up 24%, to 24,000 tons. Capital expenditures are expected to continue at the annual rate of about \$290-380 million/year during the next few years. Except for petrochemicals, the stress for the past few years has been on improvement and automation, not new plant construction. Construction outlays in '58 totaled about \$80-85 million.

France is planning major strides in the next few years. Chemical sales in '57 (last year for which figures are available) totaled almost \$3 billion, compared with \$2.6 billion in '56. Capital expenditures: \$154.5 million.

France's Chemical Goals: Among France's output goals for '61: plastics, 335,500 tons; chlorine, 315,000 tons; nitrogenous fertilizers, 755,000 tons; synthetic rubber, 70,000 tons; sulfur, 60,000 tons.

Italy's '57 chemical sales hit \$2

billion. In '58, production rose 6.3%. Unofficial estimates peg annual growth at 10-15% for the next few years. Liveliest areas will be petrochemicals and fertilizers. Between '50 and '57, plastics consumption rose 900%, to 244 million lbs.

Chemical industry sales in the U.K. were an estimated \$3.7 billion in '57, about the same as last year. Next year, total chemical output is expected to rise 3.5-4% (petrochemicals alone will go up 25-30%), and to score an annual increase of 7-8% over the next five years. Exports in '58 dropped to \$736.4 million, down \$12.3 million from '57. About 15.6% of Great Britain's chemical exports went to the Common Market nations last year.

Like their counterparts in the U.S., British producers foresee no large, immediate impact on their sales from the Common Market. But increasing self-sufficiency in the Common Market in many product lines, coupled with rising trade barriers against nonmembers, may spell trouble ahead for "outsiders."

Merger in the Making?

Food Machinery and Chemical Corp. is in the thick of high-level negotiations with Sunland Industries Inc. (Fresno, Calif.)—reportedly to buy the latter.

If Sunland accepts, FMC's Niagara division would take over the company, along with its well-developed Western markets. Sunland mixes fertilizers, produces insecticides, herbicides and other agricultural chemicals.

The Niagara division specializes in insecticides, could make good use of Sunland's broad product line, including—among others—arsenicals, phosphates, cryolite, nicotine, DDT, and chlorinated hydrocarbons.

Sales of the West Coast firm are believed to average about \$20 million, putting it among the largest of the agricultural chemical manufacturers in California.

With merger talks going on behind closed doors, FMC's offer is not known. But, since Sunland is privately held, a cash transaction is likely.

At *CW* press time, neither firm had made a final decision. But negotiations were well along, with the two companies said to be "very near" agreement on terms.

RCI Goal: 12% Gain

Eight new plants are abuilding. Sales have been boosted 13.5% (to \$74.2 million) in recession-ridden '58. A stock split is in the works. Little wonder Reichhold Chemicals now sees itself closing in on a \$100-million/-year sales target.

This optimistic outlook was voiced last fortnight at a meeting of the Providence Society of Financial Analysts. Reichhold's spokesman: H. W. Mason, Jr., administrative vice-president and general manager.

Despite the brisk sales performance, Mason told the Rhode Island analysts, the '58 profit climb was flattened somewhat by price cuts, particularly in chemicals for the automotive industry. Nevertheless, earnings rose 6-9%, to \$3.3-3.4 million.

Since last July, sales and profits have made a "tremendous pickup, which won't stop," he said; '59 forecast: sales up 12%, to \$83 million; profits up 12%, to \$3.75 million.

Keys to Growth: Reichhold's rapid sales growth, Mason said, is the payoff of an intensive program of horizontal and vertical expansion, integration and research.

Until '56, Reichhold plowed almost all earnings back into new plants. Basic growth philosophy has been to drive a product's sales up, even at the expense of profit margins, until

a market is created, not only for the product but also for the raw materials going into it. Expansion into production of the raw material is the logical next step.

This vertical integration has helped Reichhold retain customers. Early last year, for example, Owens-Corning Fiberglas began making its own phenolic resins for binders, instead of buying them from Reichhold. But Reichhold held on to the Owens-Corning account by becoming its phenol and formaldehyde supplier.

And many of RCI's paint-producer customers have started making their own alkyd resins. By swinging into production of phthalic anhydride, pentaerythritol, and maleic anhydride, Reichhold continues to hold these customers.

Strength in Numbers: Back in '39, more than 90% of its products were going to the paint and varnish industry. By '58, the surface-coating producers accounted for only 32% of RCI's rising sales. Meanwhile, sales to the plastics industry had grown to 34% of total business, and sales of colors amounted to 4%. Basic chemical producers now take 30% (table, left) of Reichhold's sales.

Of RCI's 3,600 customers, no firm takes more than 4% of total sales. About 10% spend \$100,000 to \$1 million/year for Reichhold products and 90% buy \$100,000 worth or less.

Research is another major force behind Reichhold's growth. Over the last 12 years, research and development outlays increased 12-fold, to \$1.7 million in '58—2.2% of sales. Between '58 and '60, the firm's R&D spending will add up to \$18 million, doubling the '55-'57 outlay.

Money from Abroad: Reichhold's foreign tie-ins have also helped round out the profit totals. The company has direct affiliation with 21 plants in 15 countries (including the new plant going up in Hong Kong), interest in four other units through its French and German affiliates. Total (unconsolidated) sales of these foreign plants were about \$55 million last year. But, because Reichhold holds minority interests, dividends amounted to only about \$100,000.

Most of the firm's foreign revenue is in the form of royalties from licensing agreements tied in with its affiliations. They grew from \$138,000 in '49 to \$800,000 in '58.

Reichhold Categorizes Its Customers

Customers' Products	% Share of Reichhold Sales
Appliances	6
Automotive and aircraft	6.4
Farm machinery	1.6
Boats	6.7
Building	15.3
Floor coverings	1.6
Furniture	4.2
Paints, architectural	15.7
Paints, maintenance	11.2
Pulp and paper	3.5
Printing ink	1.8
Wood preservatives	1.4
Other process industries uses	21.8
Miscellaneous	2.8

Food Colors Face a Crisis

Makers of food colors—and some of their prime customers—are facing a crisis: they're making no coloring material that will be legally usable by citrus growers after March 1, and the packing season is at hand. But the crisis may spur Congress to act on color additive legislation.

Bringing matters to a head is the expiration March 1 of a special Congressional permit that has allowed citrus growers to use coal-tar color Red 32.

This week will see reintroduction of one bill that was offered last year. But more likely to get action is a bill introduced a few weeks ago that would permit the Food & Drug Administration to authorize a new color—Citrus Red No. 2—for coloring oranges. The new color has been tested by industry and proved safe—apparently to FDA's satisfaction—and may be okayed by Congress this month.

FDA Stand Upheld: Also forcing action is a recent Supreme Court ruling that upholds the Food & Drug Administration policy on coal-tar colors. FDA—said the high court—may not certify any coal-tar color for use in any food if the color is not absolutely harmless. What's more, the court agreed that FDA cannot set up safe tolerances for use of such a color in foods (*CW Business Newsletter*, Dec. 20, '58).

Most likely way out of the muddle will be the new bill, a stop-gap measure sponsored by Sen. Spessard Holland (D., Fla.) and Rep. James Haley (D., Fla.). They want the new Red No. 2 authorized for use until Congress writes a general color bill.

One hitch that could develop, however, touches on the delicate question of whether Congress will go still further by writing broad, new color additive legislation—much along the lines of the food additive act of '58. Also, FDA wants a two-year limit on any interim measure.

Veteran Washington observers are betting that the citrus industry will get a law by March 1, with a compromise period of three years during which the new color can be used.

New Pressures: Such a compromise doesn't necessarily mean, however, that Congress is three years away

from enacting a general color additive law. This week, Rep. Thomas Curtis (D., Mo.) is planning to reintroduce his color additive bill. Last year, FDA had reservations about this bill, but it's pretty much in line with the agency's objective of a more flexible law.

Other FDA objectives: the law should apply to all colors—not only to coal-tar colors—and require that they be pretested for specific applications before they are certified.

This troublesome situation is underlined by FDA's formal order banning further use of four more coal-tar colors—Yellows 1, 2, 3, and 4—after its action on Red 32. As FDA's re-testing of coal-tar colors continues, more colors will likely be banned.

Some Agreement: Apparently, FDA and the color industry agree on basic philosophy for a new color additive law. In fact, one observer described a meeting last month between FDA officials and representatives of the Certified Food Color Manufacturers as "a love feast."

But there are differences. A major one centers on the "grandfather clause." The Curtis bill would permit continued uses and levels of use of coal-tar colors already on the permitted list, until FDA has completed its testing program. The industry seems to favor this approach, but FDA thinks this is too lenient.

FDA prefers that 11 colors now on the permitted list be re-examined and—unless existing data is sufficient—be retested by industry within a reasonable time to establish a precise toxic potential for each color.

Petrochemical Pickup

Canada's petrochemical boom is gathering momentum this week.

Natural gas producers in the Nevis field of southeastern Alberta have signed a \$3-million contract with Fluor Corp. for a natural gas processing plant; Polymer Corp. this year will start construction of a butadiene plant somewhere in the same province; Canadian Industries Ltd. will almost double the capacity of its large polyethylene unit at Edmonton, Alta.; and Du Pont will soon complete polyethylene film and resin plants in Ontario.

The Alberta gas unit—construction is slated to get under way this summer—will process 40 million cu.ft./day of natural gas. Financing will be provided by Standard Oil of California, Home Oil, Tennessee Gas Transmission, Pan American Petroleum, New Superior Oils of Canada, and Canadian Superior Oil of California.

The new plant will use gas delivered by Alberta Gas Trunkline to the Trans-Canada Pipe Line system.

Few details are known about the proposed butadiene unit to be built by the government-owned Polymer Corp. Last week, President E. R. Towse said a construction start will be made this year at an unspecified site in Alberta.

Also in Alberta, near Edmonton, Western Chemicals Ltd. is blueprinting a 50% expansion of its chlorine-caustic plant. The company will up production to 64 tons/day of caustic soda and 60 tons/day of chlorine.

New construction, slated for completion in '59, will cost more than \$1.5 million. Most of the output is earmarked for Alberta customers, but some will be sold in Ontario.

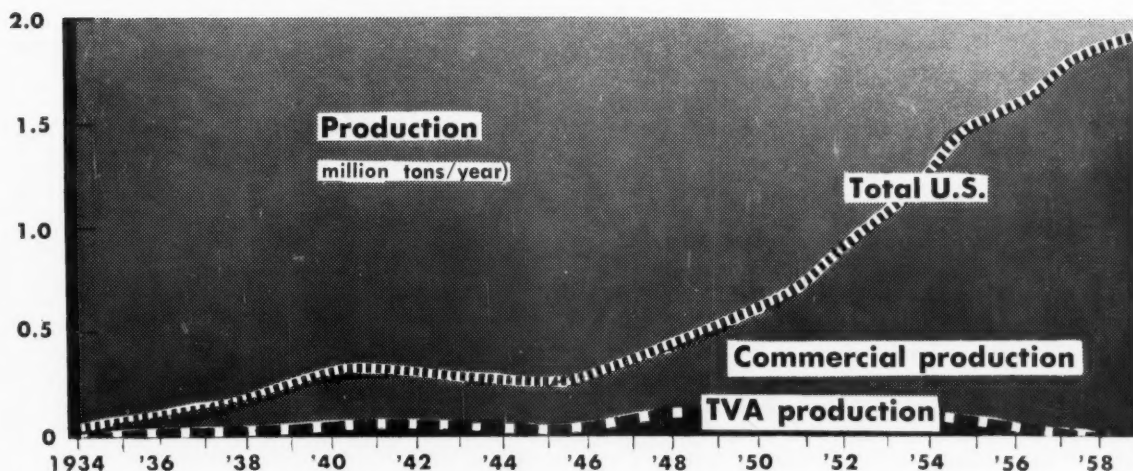
Capacity boosts for Western's Edmonton plant have been frequent since the unit went onstream in '54 with an initial output of 10 tons/day of chlorine and 12 tons/day of soda.

In Quebec, Canadian Industries Ltd. will add another 18 million lbs./year of polyethylene capacity to its Beloeil plant—bringing total capacity to 40 million lbs./year.

And Du Pont of Canada expects to have a new polyethylene film plant at Whitby, Ont., ready early in the spring. Its linear polyethylene resin plant at Sarnia, Ont., is due to be operating late this fall.

Other developments (*CW Business Newsletter*, Jan. 24): Dow Chemical is proceeding with plans for a chemical center in western Canada; Rohm & Haas's Canadian affiliate has just purchased 210 acres of land in Morrisburg, Ont., for possible expansion—though the parent firm discounts reports that a \$2-million plant will be built there; Canadian Industries Ltd. last month completed modernization programs on fertilizer plants at Hamilton and Ingersoll, Ont.; and Dominion Tar & Chemical will diversify further into the building-materials field with its \$28-million acquisition of Gypsum Lime and Alabastine.

Concentrated Superphosphate: End of the trail for TVA



TVA Tallies 24-Year Phosphate Totals

Closing the books on its output of 48% concentrated superphosphate, Tennessee Valley Authority this week claims credit for having helped boost U.S. demand for this fertilizer nearly 27-fold in 24 years—from less than 70,000 tons in 1934 to an estimated 1.9 million tons this year.

And TVA says it carried out its share of this market development work with 24-year domestic shipments totaling not quite 1.8 million tons (for testing and demonstration work)—about 11.2% of total U.S. production of such material over that period (see chart).

Now, TVA—which has drawn fertilizer industry criticism for the extent of its farm demonstration program (*CW*, Feb. 8, '58, p. 75)—is seeking to popularize four newer products: (1) 54% high-analysis superphosphate; (2) diammonium phosphate (21-53-0); and two experimental granular fertilizers—(3) ammonium phosphate nitrate (30-10-0) and (4) ammonium sulfate nitrate.

Stepping Up Shipments: Although its total fertilizer output is less than 2% of all U.S. chemical fertilizer consumption, TVA's 1958-59 shipments of these four newer products will likely be big in contrast with commercial sales of comparable materials. This is partly because commercial production is not yet large, and partly because TVA is carrying out relatively large increases in its

current work with these materials.

In the current fiscal year (ending June 30), TVA expects to distribute: approximately 25,000 tons of 54% high-analysis superphosphate—a 57.5% increase over last year; and about 5,000 tons of ammonium sulfate nitrate, nearly double '58 shipments.

Of the high-analysis superphosphate moving out of TVA's Wilson Dam plant at Sheffield, Ala., this fiscal year, nearly all—23,975 tons—is ticketed for use in the agency's distributor demonstration program.

This is described as a cooperative effort involving fertilizer manufacturers, wholesale distributors and dealers, fertilizer specialists of land-grant agricultural colleges in various states, and numerous individual farmers. Farm families in TVA's test-demonstration program are to get 900 tons; 25 tons are allocated for basic agronomic research; and 100 tons will go to other federal agencies.

Pattern for 'Super' Shipments: In TVA's 24-year work on 48% concentrated superphosphate, the cumulative distribution pattern was quite similar. More than two-thirds of the shipments—66.84%—went into a 38-state distributor demonstration program. The test-demonstration program accounted for 14.63%. During the 1937-41 crop years, TVA sold 240,000 tons (12.77% of the 24-year total) to the U.S. Agricultural Adjustment Administration, which distribu-

ted it (along with agricultural lime) in lieu of cash payments to farmers in AAA's soil conservation program. This, too, helped show the value of the 48% product, TVA says.

Exports took 5.24% of TVA's concentrated superphosphate output. This was part of the U.S. lend-lease program during World War II; overseas shipments were intended to support wartime food production programs, chiefly in Britain. The rest of TVA's 48% "super" went into research (0.27%), other TVA programs (0.22%), and other federal agencies' activities (0.03%).

A TVA spokesman—in claiming success for the newly terminated concentrated-superphosphate program—noted that, in 1934, only six commercial plants were producing this material and that nearly all of their output was used in mixed fertilizers. By 1958, he says, there were 14 plants in operation, not counting TVA's; at least four others were capable of diverting phosphoric acid for production of the concentrated superphosphate; and another major plant was under construction.

In addition, he says, many plants that primarily produce the 20% normal superphosphate are also manufacturing concentrated superphosphate, using purchased phosphoric acid. Much of the present output is going into direct application—and for pastures as well as for croplands.

EXPANSION

Phosphates: Monsanto Chemical Co. will soon finish construction of a new sodium polyphosphate plant at its Long Beach, Calif., complex. Target date: March 15. The unit will be operated by the company's Inorganic Chemicals Division.

Adhesives: J-G Chemists Co. (St. Louis), producer of industrial adhesives, will open a plant by mid-'59 in Murray, Ky. The company's existing St. Louis unit will remain in operation until this spring, when the majority of its activities will be transferred to the Kentucky plant.

Granulated Fertilizers: Davison Chemical Division of W. R. Grace & Co. is starting on a \$500,000 expansion of its fertilizer plant at Ft. Pierce, Fla. The addition will produce granulated fertilizers.

Paper: Halifax Paper Co. (Roanoke Rapids, N.C.) has purchased 22 tracts of timber land in Craven, Jones, Duplin and Onslow counties of North Carolina. The land was formerly held by Goldsboro Lumber Co. (Goldsboro, N.C.), and more recently by Winsett & Johnson Co. (Washington, D.C.).

COMPANIES

Warner-Lambert Pharmaceutical Co. plans a two-for-one split of its common stock. Directors will ask stockholders' approval at the company's annual meeting May 12. Shareholders will also vote on a proposal to boost authorized common stock from 3 million to 6 million shares. Dividends would be increased 4%.

Chemical Fund Inc. directors last week voted a two-for-one stock split, will ask shareholders to approve at the annual meeting March 3. Stockholders will also vote on a plan to double authorized capital stock from 15 million to 30 million shares.

Libbey-Owens-Ford Glass Co. directors will propose a two-for-one stock split at the company's annual shareholders' meeting April 21. If approved, directors say they will boost dividend rates by 10%.

American Enka Corp. will purchase William Brand & Co. (Willimantic, Conn.), producer of plastic-covered wire, for an undisclosed amount of cash. The acquisition is the second step in American Enka's current diversification program. Last year, it acquired Rex Corp. (West Acton, Mass.), producer of wire and cable.

Harbison-Walker Refractories Co. (Pittsburgh) has acquired Pacific Clay Products' refractories division in

Ione, Calif., for cash. Pacific Clay President John Fredericks said proceeds from the sale will be used to expand production of vitrified sewer pipe and to reduce the company's long-term indebtedness.

Arkansas Louisiana Gas Co. plans to bid on the Maumelle Ordnance Works near North Little Rock, Ark. The ordnance works was recently released by the Army and put up for sale to private industry. Ark-La would convert the \$9-million plant to chemical production.

Facilities include production lines for ammonium picrate, units to produce and concentrate nitric acid, warehouses, storage tanks, and service buildings.

Du Pont has formed a new foreign and banking division that will represent the company's treasury department in foreign financial matters. Chief of the new segment is Eldon Robinson, newly elected assistant treasurer.

FOREIGN

Fertilizer/Korea: Five German firms will build a jointly owned \$23.5-million fertilizer plant in South Korea. Construction will get under way this year with completion slated for mid-'61. Capacity: 85,000 tons/year.

Chemicals/Rumania: Rumania and the U.S.S.R. have signed an agreement providing for \$60 million in credit to be used by Rumania for building its largest chemical combine—the Borzesti chemical center.

Included will be a 210,000-tons/year nitrogenous fertilizer plant, which will later be expanded; a 50,000-tons/year synthetic rubber factory; an 18,000-tons/year phenol unit; a 45,000-tons/year caustic soda plant; a 36,000-tons/year polyvinyl chloride section; and facilities to turn out 1,250 tons/year of insecticides and 500 tons/year of herbicides.

The chemical center is to be the major part of Rumania's planned industrialization during the current seven-year plan.

Fertilizer/India: The Indian government has just approved plans for a \$48-million fertilizer plant to be built on Trombay island, near Bombay. The new state-owned plant, fifth on the list of major fertilizer units being built in India, will be constructed either by the British subsidiary of Chemical Construction Corp. (New York) or by Montecatini (Italy).

Chemicals/China: Peking radio says Chinese chemical plants near Tientsin are extracting metallic sodium, magnesium and calcium from sea water.

The broadcast also said plants in the area are producing epoxy resins for airplane construction uses.

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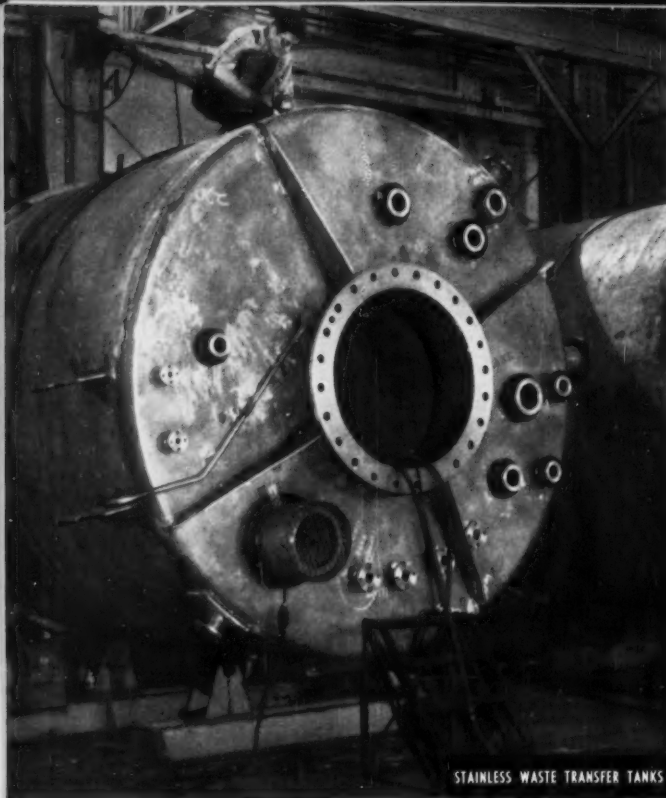
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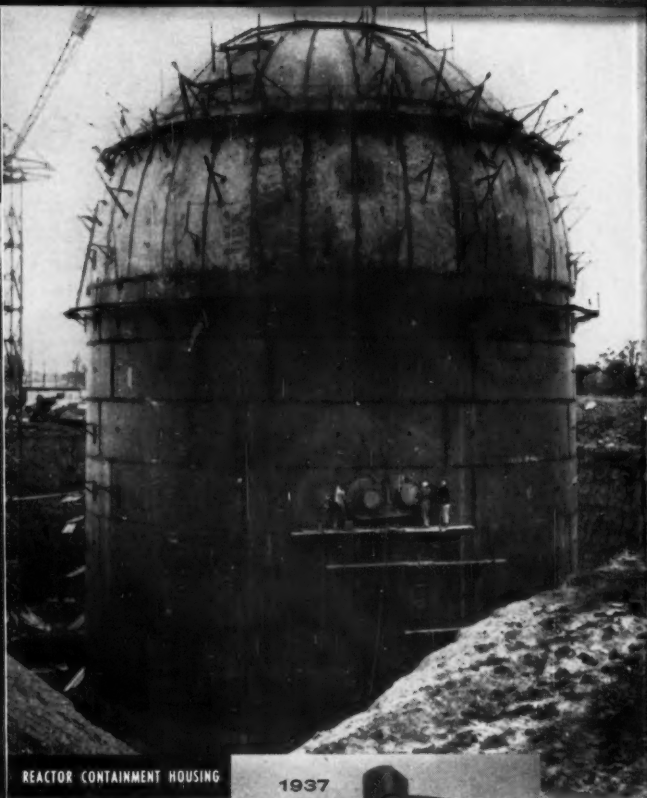
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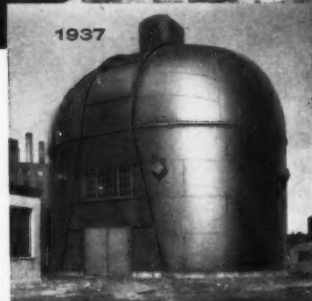
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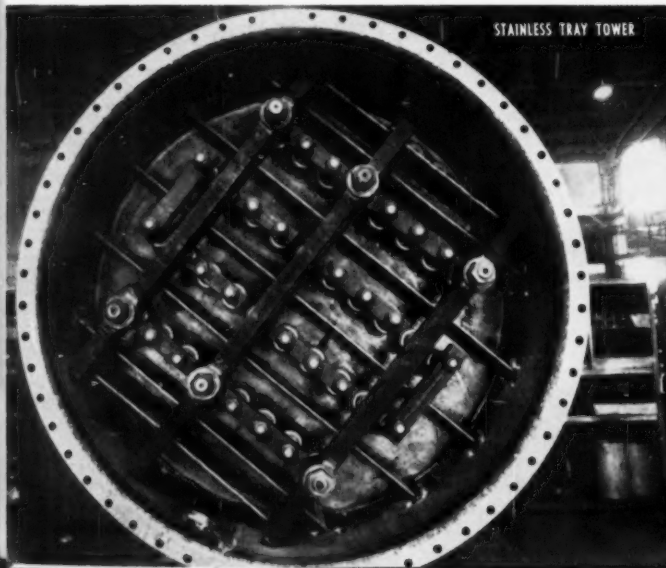
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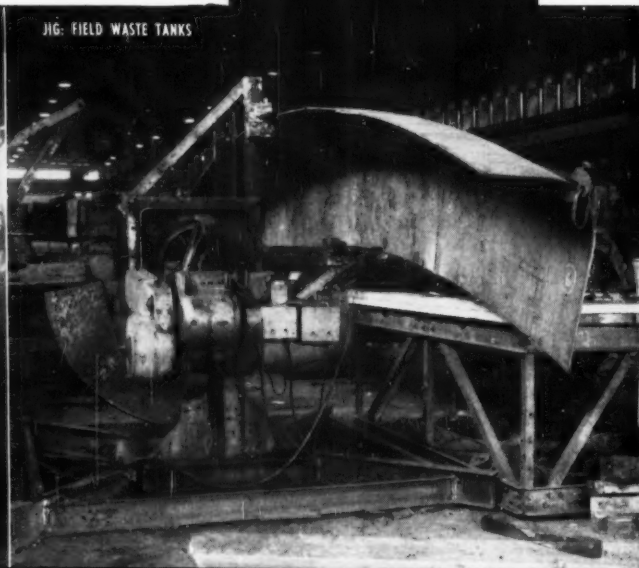
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Washington Newsletter

CHEMICAL WEEK
February 7, 1959

Seekers of increased tariff and quota protection are rallying to the cry of "national security."

National security is written into the Reciprocal Trade Agreements Act, the Buy-American act, the Johnson and Battle acts covering East-West trade controls, and other trade laws. It provides the authority for restricting foreign trade that is found to injure or threaten injury to industries whose productive capacity is ruled "defense-essential."

The laws have broad language; and Section 8 of the Reciprocal Trade Agreements Act, which deals with this avenue to trade protection, was further loosened by the last Congress.

Note the important cases that already have resulted in new trade restrictions on these grounds: First, there was a ruling against oil imports under the old trade law, which may soon be tightened under the new Section 8. Then, there was a successful chemical industry campaign against loosening East-West trade controls on domestic industry technical equipment and know-how. And recently, domestic electrical equipment makers hit the headlines when an Army Engineers' contract for two hydraulic turbines for a multipurpose dam at Greer's Ferry, Ark., was awarded to a small Philadelphia company. The official reason: big machine tools used in making its product might be lost for possible defense production if it didn't get the contract for the turbines.

The Greer's Ferry case came under the Buy-American act. A broader plea for industry-wide protection is pending under Section 8. Petitions from domestic tungsten and cobalt producers are also pending at the Office of Civil and Defense Mobilization. So is a case involving wool knit gloves. There is a chance of another one on cotton and rayon broad-woven fabrics.

Under the Buy-American act, which covers federal purchases, there are current hassles involving office machinery and equipment and road-building materials.

Foreign competitors are unhappy about the trend, and will fight each case. But with a basically liberal set of trade laws on the books for another three years, national security is an attractive argument on which an increasing number of domestic trade protection seekers will base their petitions.

•

Watch for greater efforts to solve atomic waste disposal problems.

Key members of the Congressional Joint Committee on Atomic Energy are convinced that hazards from atomic wastes—the worst of which results from chemical reprocessing—ultimately may be worse than fallout from weapons tests. And experts have told the committee that disposal costs are a greater obstacle to economic nuclear power than industry seems to realize.

Washington

Newsletter

(Continued)

More research and more regulation is the likely prescription. There's little hope that enough economic uses for waste products can be found to help much. But there's optimism that research will develop improved disposal methods—in fact, AEC experts say, it's about time for pilot-plant experiments on new ways of dealing with high-level wastes. Meanwhile, since disposal problems are international in scope, there may be a move for closer international cooperation.

•
The antitrusters plan to step up their antimerger program. Antitrust chief Victor Hansen, commenting publicly for the first time on the government victory against a Bethlehem-Youngstown Steel merger, says the merger program "should expand" as a result.

Hansen obviously feels that the Bethlehem ruling clears away lots of uncertainties in the merger law. More cases can be expected to test the Clayton Act's powers to prevent industrial concentration.

With Congressional investigators preparing a study of government enforcement of the merger law, look for some new types of cases, too. So far, the government has not tackled a so-called conglomerate merger—one involving companies in unrelated industries. Congress will press Hansen on this. So don't be surprised if the Antitrust Division springs a conglomerate merger case before long.

Hansen also promises action as a result of "several major" Sherman Act investigations. He won't specify, but this hints at possible monopoly cases in already highly concentrated industries. Two most likely candidates are not in the chemical field—autos and television networks.

•
There's only faint hope for the Administration farm plan. Many key legislators—from rural states—call Agriculture Secy. Ezra Benson's proposals the worst so far. Benson asks for lower price supports on wheat, peanuts, tobacco. His theory is that this would kill farmers' urge to over-produce, lead to less need for federal production controls, and ultimately restore normal supply-demand factors in the commercial marketplace.

Congress doesn't have to write any new major farm law. That works against Benson. All this session needs to do is give the Administration an extension of the overseas program for disposal of surplus crops. This it will do.

Democrats lean to the side of some form of direct farm subsidy. There's little chance that President Eisenhower would ever willingly accept this. And there's not much chance that Congress could force it on the White House by overriding a Presidential veto.

Insiders give Benson only one chance: urban support. No one in Washington is ready to predict yet that it will happen, but there are reports that urban-area taxpayers are pressuring their Congressional delegations to "do something" about the rising costs of crop supports and surplus storage.



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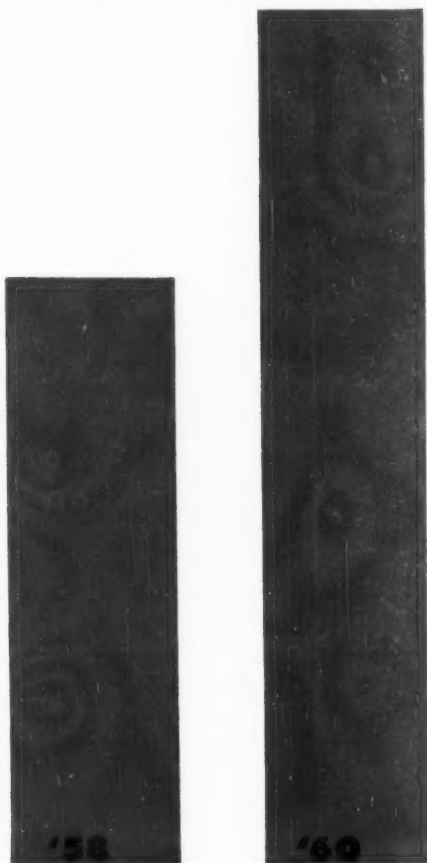
400

300

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...resulting in these major raw material requirements:

million lbs.

acrylonitrile	155
adipic acid	235
dimethylterephthalate	86
dimethylformamide	25
ethylene glycol	34
hexamethylenediamine	184
vinyl acetate	8
vinyl chloride	8

*Including polyamides, acrylics, polyesters, vinyls, polyethylene

Synthetics Brighten Textile Outlook

All major segments of the chemical process industries are under constant study by raw-material suppliers. But few chemical consuming industries are undergoing closer scrutiny than the textile business, whose raw-material requirements dip deep into countless chemical hoppers. By this week, some new bright spots—and a few chronic problems—were clearly evident to the textile industry's chemical suppliers.

The picture today is a study in contrasts—a symptom of the difficulty in sizing up† the textile field

and its relation to the CPI. Part of this problem arises because textile chemicals are in two separate groups: compounds used to make synthetic fibers (which include basic chemicals used to make the fiber-forming chemicals), and materials used in processing of finished fibers. In both areas, there are widely varying prospects.

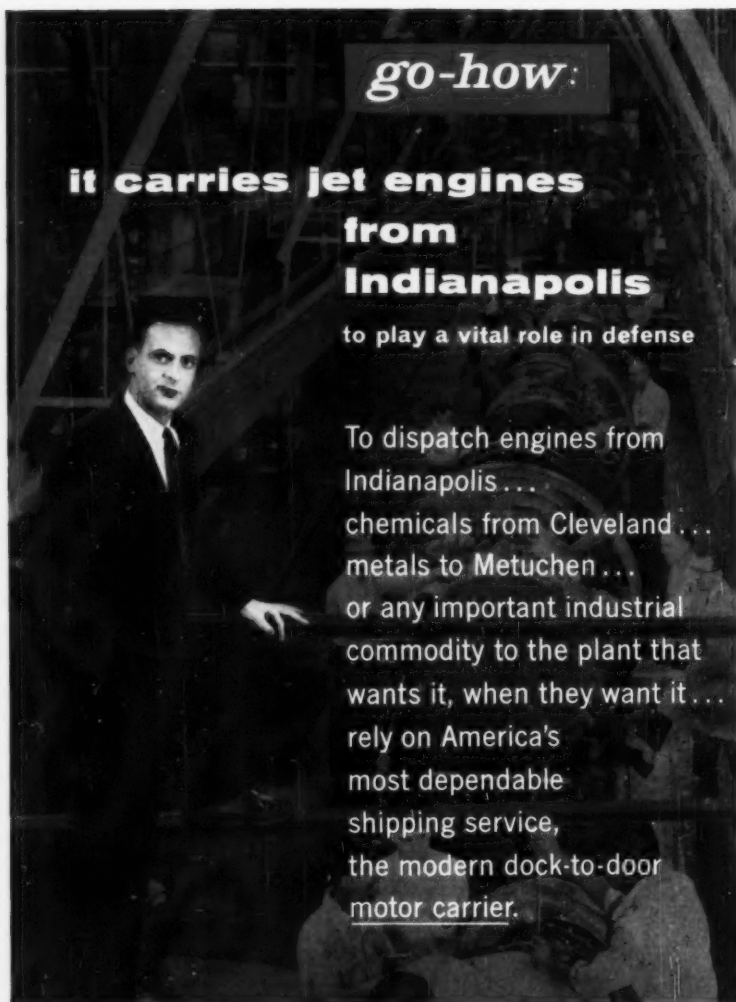
Sunny for Synthetics: For purely synthetic fibers — but not including man-made cellulose — the '59 outlook is optimistic. One industry forecast (*CW*, Oct. 11, '58, p. 27) indicates that U. S. mill consumption of synthetic fibers in '59 will jump to 530 million lbs., 20% higher than in '58 but still far below U. S. syn-

thetic fibers capacity of more than 900 million lbs./year. In contrast, mill consumption of cotton will probably increase about 4%, wool and cellulose about 7% each.

The industry-wide gains by fibers, if realized, will obviously provide a much-needed economic boost to almost every sector of the U. S. chemical industry. But while the big growth years are believed just ahead, the market pattern fades a bit: gains by synthetics will often be made at the expense of more traditional fibers.

Fiber Fight Looms: Synthetic fibers will be making deeper inroads into natural fibers markets, but there'll also be some rough competition as

†One important probe into this area will come next month, at a textile-markets session of the Chemical Market Research Assn. Feb. 18-19 at the Dinkler Plaza Hotel in Atlanta, Ga.



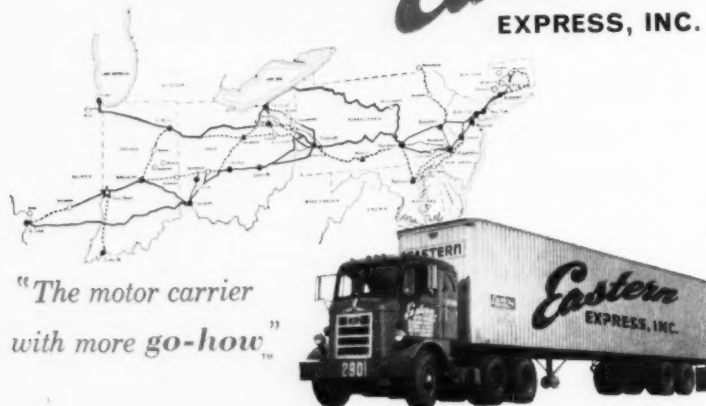
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synthetic is pitted against synthetic.

Here's one conservative forecast of synthetic fibers production in '60 (million pounds): polyamide (nylon), 350-360; acrylics, 170; polyester, 100; vinyl and polyethylene, 40-50; total noncellulosic synthetics, 660-680.

And that's only the beginning. By '75, U. S. synthetic fibers output will probably hit 2 billion lbs./year (4 billion, if man-made cellulose are included), according to the President's Materials Policy Commission.

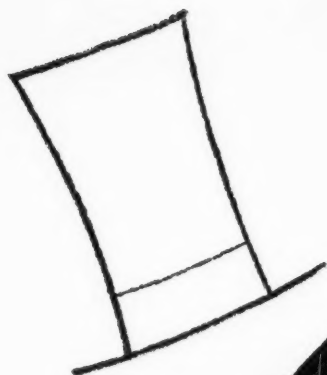
Nylon Nudge: Polyamide (nylon) fiber production in '58 came quite close to the '57 output estimated at 300 million lbs. By '60, annual nylon production is expected to be in the 350-360-million-lbs. year range.

Thus, adipic acid required for nylon production would amount to about 235 million lbs. in '60. Incidentally, about 85% of total U.S. adipic acid consumption currently funnels into nylon making (*CW*, Aug. 3, '57, p. 74). Hexamethylenediamine used in nylon production in '60 will probably amount to about 184 million lbs.

Forecasts of the market for more-basic raw materials (e.g., phenol, benzene, hydrogen, ammonia, caustic soda), used in making the acid and amine, are trickier. Case in point is benzene. Estimates of the '65 benzene demand for adipic acid for nylon range from 30 to 60 million gal., although approximately the same total nylon outputs are assumed (*CW*, Nov. 8, '58, p. 89). The forecasts are widely divergent because the experts differ about relative amounts of cyclohexane — intermediate used to make adipic — that will be made from benzene and amounts that will be extracted directly from petroleum.

Acrylics Active: Estimates of raw-material requirements by acrylic fibers also vary. One trade estimate puts '60 output of Orlon at 120-130 million lbs., Acrilan output at 45 million lbs. This spells markets for 120-130 million lbs. of acrylonitrile and 24-26 million lbs. of dimethylformamide for Orlon, and 38 million lbs. of acrylonitrile and 6.8 million lbs. vinyl acetate for Acrilan.

And related types of acrylic fibers (e.g., Creslan, Verel, Zefran, Darlan) will further boost demands for vinyl and acrylic compounds. Each pound of Dynel, for example, takes 0.6 lbs.



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Boiling Point °C, 760 mm.....	1.74
°F, 760 mm.....	—23.76
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Liquid—23.7°C.....	—10.76
Gas 25°C.....	1.3712
Solubility (in cc.) of Methyl Chloride Gas in 100 cc. of solvent (20°C, 760 mm)	1.000703
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MARKETS

of vinyl chloride, 0.4 lbs. of acrylonitrile, 0.2 lbs. of acetone.

Other types of synthetic fibers call for entirely different chemical raw materials, of course. The '60 demand for polyester (Dacron) fiber will be about 100 million lbs.; this translates into a need for 86 million lbs. of dimethylterephthalate, 31 million lbs. of ethylene glycol.

Accent on Acetate: Acetate rayon production last year increased about 8%, but viscose rayon output declined some 20%.*

The 283 million lbs. of acetate rayon produced last year required 176 million lbs. of cotton linters and wood pulp, close to 170 million lbs. acetic acid and acetic anhydride (net, not including recovered material), 14 million lbs. of sulfuric acid, close to 79 million lbs. of acetone, a small amount of caustic soda for saponification.

The 702 million lbs. of viscose rayon turned out in '58 called for 808 million lbs. of wood pulp/liners, 667 million lbs. of caustic soda, 246 million lbs. of carbon disulfide, 1,018 million lbs. of sulfuric acid.

The outlook for cellulosic man-made fibers this year is cheerful; industry observers estimate the overall production at about 7% higher than in '58.

Processing Pickup? A plethora of chemicals used in processing finished fibers stand to benefit by the expected increase in fiber consumption in '59.

An estimated 117 million lbs. of processing chemicals (not including those for making fibers and dyes) were used in '58. Included (million pounds): organic acids and anhydrides, 43.5; alcohols, 33; glycols, polyglycols and glycol ethers, 16; ethanolamines, 7; glycerine, 4.4; ketones, 4.4; miscellaneous chemicals (chlorinated solvents, hydrocarbons, etc.), 8.7.

Because of the complexity of the textile chemicals business, not all chemical consumption breakdowns reflect the over-all fiber demand fluctuations. For example, use of miscellaneous cyclic organic chemicals for textile purposes has been increasing during the past few years. According to the U.S. Tariff Commission, a total of 1.176 million lbs., worth \$1.69 million, were sold in '56, and 1.79

million lbs., worth \$2.52 million, in '57—despite sagging fiber demands. The Tariff Commission does not indicate whether any of these chemicals are used in synthesis of fibers. In any case, the total involved is a relatively small part of the total textile chemicals market.

One fairly recent, detailed examination of the market is that by Lester Berger, of Union Carbide, who divided the total '55 market into three broad categories: \$1.9 billion worth for chemicals to make synthetic fibers, \$211 million for processing, \$175 million for dyes and finishes. The latter two categories add up to \$386 million, about \$14 million less than today's estimated \$400-million textile chemicals market.

Berger's breakdown of \$156-million market for nonpetrochemical processing materials (in million dollars): starches, modified starches and gums, 35; soaps and synthetic detergents, 24; sulfuric acid, 19; phosphates and silicates, 17.2; lubricants, 15; other organic salts, 15; bleaches, 10.5; caustic soda, 7.5; miscellaneous inorganic chemicals, 13.

Dyes Dwindle: Some of Berger's figures can be updated. More than nominal production/sales declines in the U.S. dye business have hurt sales of many raw materials. Sales of U.S.-made synthetic organic dyes (75% of which go into textile applications) skidded from 156 million lbs. in '55 to 127 million in '57. Dye production slumped from 168 million lbs. in '55 to 143 million in '57.

U.S. dye production figures for '58 aren't yet available, but estimates point to a joyless 134-million-lbs. turnout. Reasons: declines in retail textile sales, slowdown of auto production.

The impact of declining dye production rips like buckshot through the virtually endless list of dye-making chemical raw materials; but the effects are most noticeable in a relatively few large-volume chemicals.

Case in point is U.S. aniline production, which slumped—specifically because of drop-off in dye use—to 104 million lbs. in '58; that's 21% less than the '55 output (*CW*, May 24, '58, p. 75).

Resin Sales Soften: A host of synthetic resins are used in many ways in treating textiles (e.g., as a binder and a waterproofer; for crease resist-

*'58 estimates based on nine-month production records.

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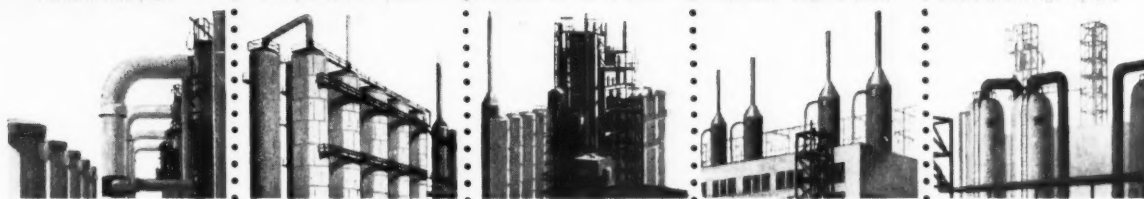
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ance and shrinkage control; to improve the hand). Most commonly used are urea and melamine types of formaldehyde resins.

Sales of these resins for textile purposes declined to 38 million lbs. in '57, from a near-39.8 million in '56 and about 40.6 million in '55. Production slumped to 41.2 million lbs. in '57, from a near-48 million in '55.

The '58 sales/production records aren't yet available for urea and melamine resins; but the 17.5 million lbs. sold in the first seven months of '58 point to a probable low level of sales for the year—possibly in the 31-33-million-lbs. range.

Consumption of polyvinyl chloride and copolymers in textile treating is combined in the Tariff Commission's data on textile and paper uses. The combined market is growing, sales reaching 68.4 million lbs. in '57, up from 63.8 million in '55.

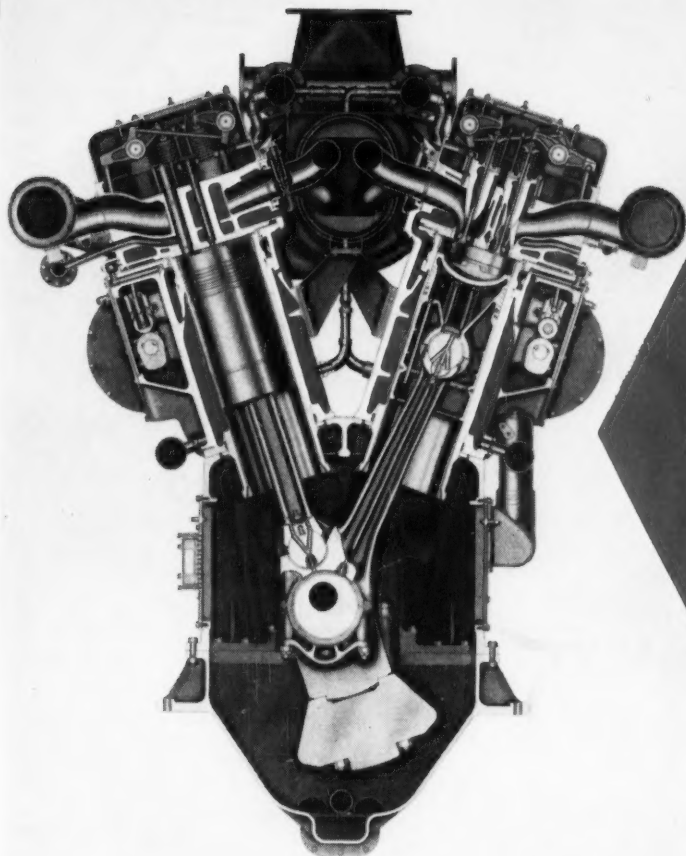
Sales of vinyl resins for textile/-paper treatment may have dropped significantly in '58. Total sales in the first seven months amounted to 31 million lbs., which indicates a likely total '58 sales of 52-55 million lbs. That's a long way from the 80-million-lbs. demand forecast by some for '61.

Mammoth Miscellanea: The list of miscellaneous chemicals that go into processing of textiles is constantly increasing. The one broad category of surface-active agents, for example, is a source of considerable debate among market researchers. Total demand for surfactants in textile processing has been put as high as 150 million lbs./year, if all sulfated oils and fats, soaps, cationic softeners, water repellents, dispersants and auxiliaries are included.

Total consumption of anionic surfactants by the textile industry in recent years has been estimated at 75-100 million lbs./year; nonionics (100% basis) some 30 million lbs./year.

Fire retardants go into less than 2 million sq. yds./month of fabric treated by solvent suspension systems, compared with more than 700 million sq. yds. during World War II and 6 million sq. yds./month during the Korean War.

Shifting Markets: It's clear to all in the chemical industry that the U.S. textile business appears to be heading into a period of unusually intense competition. And when one fiber wins



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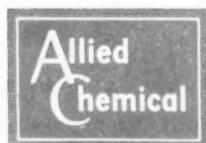
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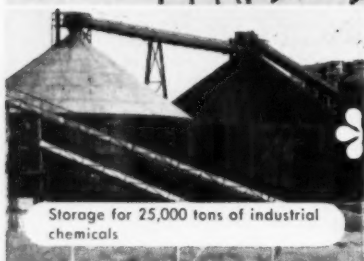
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a market from another, significant shifts in raw-material requirements will almost certainly follow. The picture will be complicated by a substantial amount of overcapacity.

Moreover, keeping up with shifts in the domestic market won't ensure a market for U.S. chemical suppliers. There's a big chance that foreign competition for the domestic fiber markets will increase—foreign producers are gearing up for large-volume production of synthetic fibers, hoping for a big slice of the lucrative market here.

At stake, for U.S. chemical suppliers, is a large bread-and-butter market, the bulwark of many individual companies. But even those areas that have heretofore been relatively stable will be carefully watched. The coming period may well create more than one market upheaval, and chemical suppliers can't take their markets for granted.

PAS Price Cut

Prices of *p*-aminosalicylic acid and its salts were cut last week by Sumner Chemical Co., Division of Miles Laboratories, Inc., "to meet import competition." These compounds, widely used—about 900,000 lbs./year—in the treatment of tuberculosis, are currently being brought in from several nations, including Germany, Italy, and Japan.

Sumner's new prices for 100-lb. lots: \$3.40/lb. for the acid; \$3.10/lb. for the calcium salt, and \$1.90/lb. for the sodium salt. The sodium salt is most commonly used; it's said to be somewhat easier to make, and more resistant to decomposition.

CW's spot-check of importers shows, however, that the imported compounds will still have a price edge over domestic materials. Imported sodium *p*-aminosalicylate has been selling for about \$1.80-1.85/lb. And the imported acid has been going at attractive tags, too—some priced at \$2.50 has been snapped up.

Sumner has had one "saver" on its side: several health departments (e.g., New York City's) have required that the PAS and calcium salt used in tabletting be not more than six weeks old when it reaches city hospitals. (Stability is the main consideration.) As a result, Sumner has several marketing areas pretty much to itself.

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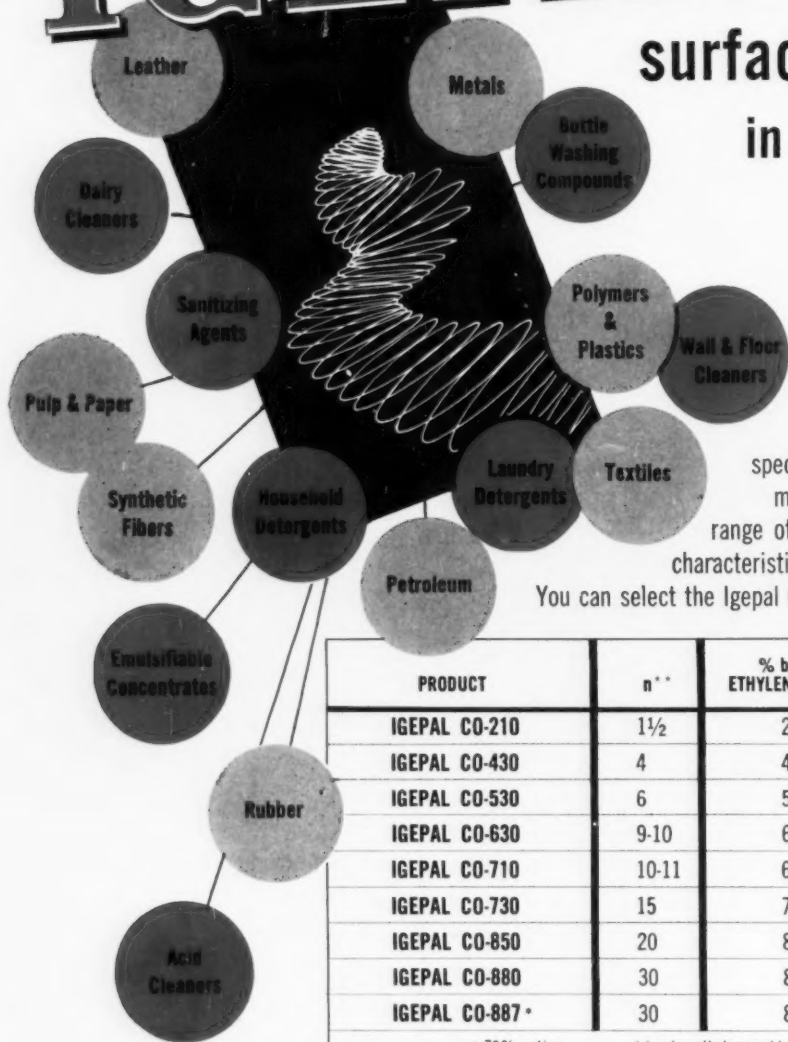
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Supersize tank cars, up to 20,000-gal. capacity, will find place in chemical shipping.

Jumbo Tankers Roll to a Rate Roadblock

Jumbo tank cars, twice the size of standard cars and capable of carrying up to 20,000 gal. of cargo, are meeting both warm enthusiasm and marked misgivings from chemical shippers. That was evident from the rough-and-tumble rate hearings held last week in New York by the Eastern railroads, and in CW's spot-check of traffic managers.

In a nutshell, chemical shippers welcome the economies the supersize cars afford—economies in leasing rates, purchase price, demurrage and

handling charges. But the same shippers are noticeably cool to the rate system that has been proposed by railroads.

The railroads propose regular rates for the first 10,000 gal. shipped and a rate 30% under the conventional cost on the remainder of the car's contents.

The net effect would be an overall 15% saving in the case of a filled 20,000-gal. car.

This rate proposal has spawned two principal objections from chemical

shippers. The first relates to freight equalization. Because some customers would be unable to handle a 20,000-gal. car, whereas their competitors could, suppliers would come under heavy pressure to allow freight equalization on shipments in normal-size cars. This pressure could quickly lead customers to demand jumbo car equalization benefits for all normal-size car shipments. And, traffic managers add, pressure for freight equalization would still come, because only a limited number of cars will be

available initially. Question is: Who will get them?

The second objection is similar, relates to commodities (such as nitrogen solutions) similar in nature but offered in a range of densities. The jumbo tank cars are limited (with some exceptions) to materials that weigh less than 9.3 lbs./gal. But smaller jumbos, of 16,000- or 18,000-gal. capacity, could serve to carry denser solutions. Net result: producers would probably have to absorb freight charges on materials shipped in the smaller jumbos.

Simpler Calculation: Ideally, the chemical traffic executives would prefer that incentive rates on shipments in jumbos be figured on an individual basis for specific items and hauls, rather than on the flat 30% reduction. And they would like to see such a rate apply to the entire quantity in the king-size cars—not just to the quantity in excess of 10,000 gal.

This proposal would prevent jumbo rate equalizations from becoming standard practice for normal-size shipments, since a general formula would be lacking.

At the very least, say some shippers, the present formula should be revised to begin discounting at 8,000 gal. rather than at 10,000 gal. This would make use of junior jumbos 10- and 12,000 gal. cars more attractive.

Because of such difficulties in rate determination, traffic men believe that the supersize cars will first be used mainly for in-company, interplant or terminal shipments, later for in-bound shipments from suppliers.

Aye Vote: Apart from the rate ruckus, chemical men are inclined to welcome larger cars warmly. Until a few months ago, use of king-size cars was largely restricted to railroads, which used them to move diesel fuel for locomotives. Now, all three major car producers—Union Tank Car, American Car & Foundry (Shippers' Car Line) and General American Transportation Co. (GATX)—have plans to develop jumbo car markets.

Shippers' Car Line is by far the most optimistic of the three; its president, H. V. Bootes, tells *CW* that the firm is conservatively scheduling 500 king-size cars for production this year and "we could make more." GATX expects to produce about 40 jumbos this year and Union is building "only against orders."

Capacities of the cars will vary with the nominal size and strength of the trucks (wheel assembly). Using 70-ton trucks, the maximum lading weight/gal. for 16,000- and 18,000-gal. cars will range from 7.1 to 9.3 lbs. For 100-lb. trucks, the comparable figures range from 9.1 to 11.6. The 20,000-gal. cars will have 100-ton trucks, will be limited to materials weighing 8-9 lbs./gal. Although the maximum lading weight ratios will cover most organic liquids, some high-density items, such as caustic soda, carbon tetrachloride and some boron compounds, will fall beyond present specifications.

Car producers claim that all standard materials of construction can be used for fabrication—carbon steel, stainless, aluminum—and that any lining may be installed. Thus, they will be suitable for carrying most chemical products. Shippers' Car Line will soon begin test-shipping to evaluate economic factors.

Economics: Jumbo-size tank cars will cost proportionately less than two cars of equivalent capacity. On a 10-year rental basis, a standard 10,000-gal. carbon steel car leases for about \$120/month. A comparable 20,000-gal. jumbo will lease for about \$210/month. Comparable purchase prices: \$11,250 vs. \$17,150. Savings, however, are proportionately less when much more expensive special-purpose cars are used. Because of the high capital investment, most users are expected to lease rather than rent.

Demurrage fees represent another advantage of the cars. Users would pay demurrage on only one car rather than on two, if it became necessary to delay unloading or return of car to the carrier. And the cars offer savings in handling; there is only one car to load, unload, shift about the plant, etc.

The big incentive, of course, is the economies of the new rate proposals. A glance at present Eastern rate structures shows why. For a 1,000-mile haul, it now costs chemical shippers 79¢ to move 100 lbs. of caustic soda solution; \$1.31 for industrial alcohols, ketones and aldehydes; 84¢ for nitrogen solutions. Using a 20,000-gal. car, an alcohol shipper would save some \$260 on a 1,000-mile haul.

Uncertain at the moment are rate proposals for compartmentalized cars. Car makers can put in as many as

six compartments, although compartmentalization raises the costs, increases the weight and reduces the total space available for shipment. Rail carriers have not yet made any official compartment-car rate proposals.

Some trade sources, however, think that a prorated formula may be offered. On a compartment car, charges would be figured separately for each item, then added to give a total charge. The total would then be prorated over the entire load and a discount of 30% figured on the load in excess of 10,000 gal. This method, however, would be open to all the criticism now made of the uncompartimented cars.

Shipper Problems: Equitable rates aren't the only problems chemical shippers face in considering shipments in the jumbo cars. In many instances, traffic volume will not be large enough to permit use of the larger units. Storage capacities, too, may be inadequate. Initially, at least, only customers taking the equivalent of two cars or more may be able to cash in on possible savings.

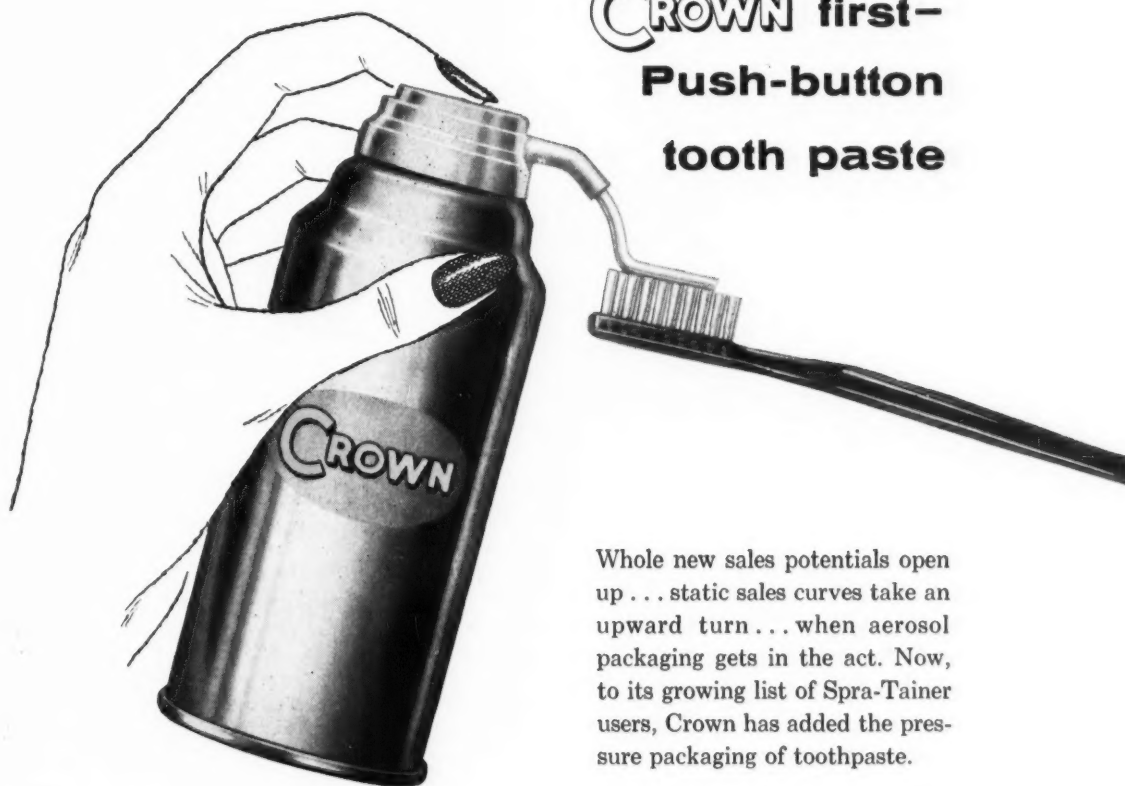
More significant, however, is the question of plant clearances and rail capacities. Although the cars have been designed to fit present railroad clearance specifications, track areas in some plants will not afford enough leeway, or have gentle enough curves, to accommodate the jumbos. Typical jumbos are 43-62 ft. long, while a standard 10,000-gal. car measures only 37½ ft. And there are problems with unloading patterns and positioning on sidings.

Moreover, many chemical plants are equipped with 60-lb. rail, believed to be generally inadequate for the heavier loads the jumbos will hold. A 70-lb. rail can be used in some cases but a 90-lb. rail is the only weight adequate for all cases. As plants are modernized, however, this problem will gradually disappear.

Another key problem relates to mileage allowances—the money refunded by railroads to car owners to compensate for supplying the cargo-carrying equipment. The mileage allowance—now 4.5¢/mile—is now the same for regular and jumbo cars. Car lines and shippers are pressing for a special allowance for jumbos—perhaps 5.5-6¢/mile.

Outlook: Despite the current difficulties with rates and clearances,

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SALES

traffic managers foresee eventual resolution of the problems and widespread use of the cars.

Although conventional cars will probably be popular for many more years, the economics point to replacement of some by jumbos. That's why traffic managers are now planning how best to use big cars.

Co-ops Cool to Tax

Farm cooperative leaders are taking a cool attitude this week to new proposals by Treasury Secretary Anderson on co-op taxation.

Under Anderson's proposal, "tax-free retention of income would be limited to three years." Co-ops could reduce taxable income only by making cash payouts to members or by making these dividends as "qualified" certificates (at least 4% interest, and redeemable in cash within three years).

So-called "nonqualified" certificates could not be deducted until they were turned in, and the payout would be made in cash.

This scheme is being staunchly challenged by Jerry Voorhis, executive director of the Cooperative League of the U.S.A. The proposal, he tells *CW*, takes away "the people's principal means of capitalizing their co-ops." Voorhis believes that, under the plan, co-ops cannot invest their own patronage refunds in their own business for longer than three years . . . nor at less than 4% interest.

Co-ops, Voorhis noted, have only limited access to capital markets because co-op securities never rise above par.

Neutral Stand: Less opposed to Anderson's proposal is Central Farmers Fertilizer Co. That wholesale co-operative—a big factor in Midwest fertilizer markets—will take a neutral stand although its members may line up on either side of the fence.

CFF's legal counsel, Harry Mulloy, tells *CW* that retained patronage refunds should be taxable but that it would be "unfair" to force redemption of qualified certificates within three years.

And in Washington, co-op leaders also lean to a longer time period—5 to 10 years. Nevertheless, an undercurrent suggests that co-ops will go along with modified versions of Anderson's proposals.



Fighting ice-choked channels, lightened barge-tow inches ahead.

River Ice Slows Barging

Colder-than-normal winter weather is raising havoc with barge shipments of cargo along the Mississippi River north from Kentucky. Ice-caused low water (down from 9 to 7 ft.) at the vital Alton, Ill., locks (above St. Louis) is delaying shipment, forcing barges to carry less-than-capacity loads. Elsewhere on the inland waterway system, however, chemical shippers are faring well.

At Alton (where the Illinois River meets the Mississippi), as many as two dozen barges have been detained to await higher water. Barge lines, plagued with channel depths running 2-3 ft. below normal, have been forced to lighten barge loads 10-20%.

Generally, barges are loaded to draw 9-ft. depths in the summer and 8-ft. depths in winter. But now many are loading for depths shallower than 7 ft. In spite of this, danger of accidental grounding has increased since marking buoys are reported out of place in many areas.

Lighter barge loads mean higher costs for chemical shippers. One barge line, however, is returning to customers part of its fees when it can't deliver all quantities contracted for because its tows must operate below capacity.

Problem Areas: Biggest problem areas so far have been on the Mississippi north of Cairo (the confluence of the Ohio and the Mississippi) and on the Illinois north to Chicago. At various times recently, the upper Mississippi has been reported virtually

clogged with floating ice. Below-normal rainfall is forecast for the next few months. Barge operators fear that "the worst is yet to come."

Shippers in the Ohio River area are more troubled with floods than with ice; traffic on the Ohio, Monongahela and the Allegheny is relatively normal. Chemical shippers in important chemical production centers along the Kanawha River (serving the Charleston, W. Va., complex) also report no difficulties except for occasional shipments to Chicago that must pass through the Alton locks.

At Chicago, the Army Corps of Engineers reports that low seasonal traffic is easing what would otherwise be a serious problem. The Calumet Sag Canal and waterways adjacent to it are termed "fairly navigable."

In other areas, however, to get around the problems caused by ice formation and dropping water levels, barge operators are pulling more barges in their "trains." And many chemical users now stockpile raw materials to facilitate winter deliveries.

Deliberate Flooding: Meanwhile, Lake Michigan water is being diverted to raise channel depths on the Mississippi. And, similar to efforts in the past, the diversion has renewed the old controversy between Great Lakes states, lake carriers and water shippers (*CW*, Feb. 9, '57, p. 106).

The Chicago Sanitary District has spearheaded introduction of a Congressional bill calling for a comprehensive study of the diversion.

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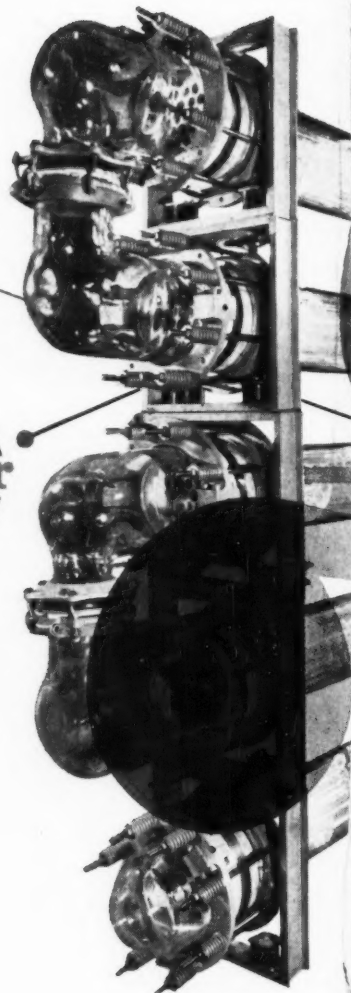
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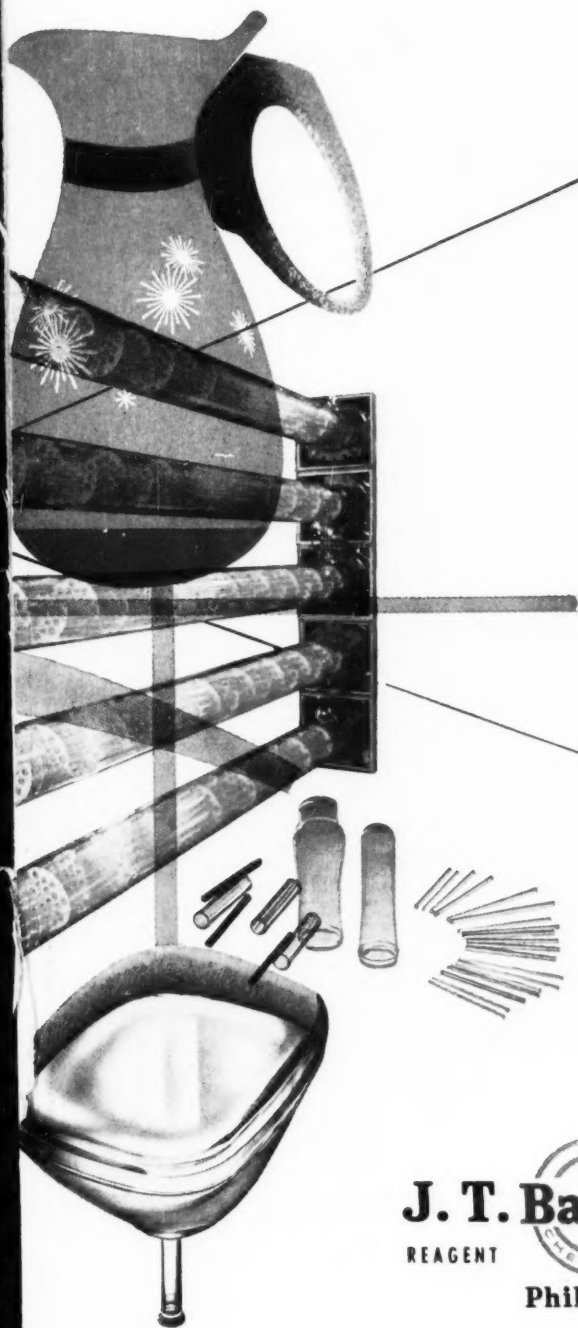
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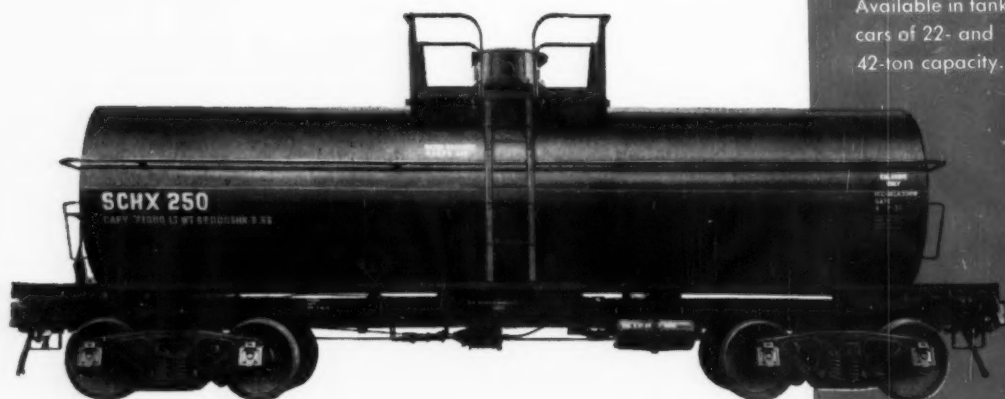
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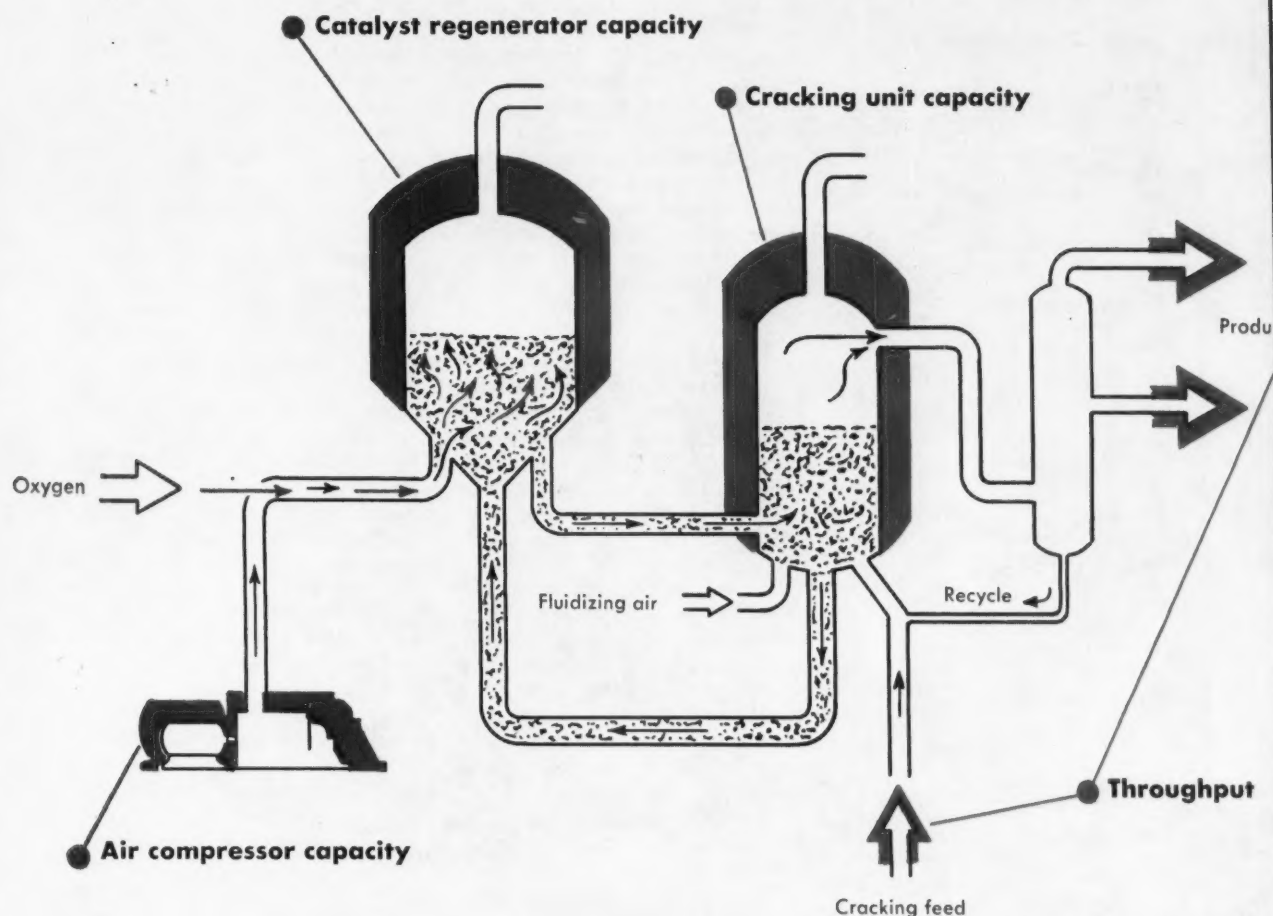
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OXYGEN ENRICHMENT BOOSTS . . .



Cat-Cracker Thrives on Oxygen-Rich Diet

Engineers at Cities Service Oil Co.'s East Chicago, Ind., refinery are this week weighing the economic advantages of using oxygen to supplement normal air supply in cracking-catalyst regenerators. The company recently completed production-scale tests, says that resulting increases in the rate and efficiency of cat-cracking and regenerating operations were "most satisfactory."

Immediate prospects for commercial application of the oxygen-enrichment technique are dimmed somewhat by budgetary considerations.

Cities Service management isn't ready to make the capital expendi-

tures that would be required. However, the company will likely put oxygen enrichment into use as soon as budgets loosen up, predicts that the technique will come into its own—not only at East Chicago, but elsewhere—starting in 1960.

Breaking Bottlenecks: Although the use of oxygen influences many other factors in the cat-cracking operation, such as throughput, conversion and over-all efficiency, it's aimed primarily at boosting regenerator capacity. First units to be converted to the new technique will likely be older installations that are sized for lower flue-gas velocities than are newer

units. Regeneration equipment is commonly a production bottleneck—particularly in the older installations—because the coke-burning operation is velocity-limited—i.e., there is the problem of getting enough air through the generator to attain maximum coke-burning capacity without blowing out the fluidized bed. And since higher conversion of cracking feedstocks produces a corresponding increase in coke formation, cat-cracker throughput is limited by regenerator capacity.

To overcome these limitations at the East Chicago refinery, Cities Service experimented with oxygen addi-

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tions of up to 100 tons/day to the regenerator air supplied to a 22,500-bbls./day cat-cracking system. Oxygen for the tests was supplied in liquid form by Linde Co. Here, according to Cities Service, are the economic advantages indicated by the trial runs:

- Coke-burning capacity of an existing unit can be increased. For units limited by vapor velocities and by the ability to go to higher-pressure operation, oxygen enrichment could be profitable until such time as the installation of an additional unit is justified.

- Burning control is improved. The unit operator has control over the stream of nearly pure oxygen, can make faster compensating changes for variations in carbon levels. Ability to quickly reduce quantities of available combustion oxygen yields fast control of afterburning conditions.

- Blower capacity can be supplemented or replaced. In the event of an emergency shutdown, oxygen could make up for the interrupted portion of normal air supply. It could also be used during a gradual revamp of an existing unit until added blower capacity is purchased and installed.

- Normal operation can be maintained during maintenance or repair of equipment. In the event of a failure of a cyclone separator or precipitator, replacement of air by an equivalent amount of oxygen would permit the unit to be kept onstream at reduced vapor velocities.

- Equipment size can be mini-
mized. For new units utilizing oxygen, vessel volume and catalyst recovery systems could be reduced in proportion to the oxygen-enrichment level.

Processing Phases: Actual test data now being evaluated at East Chicago provide more tangible evidence of the operating efficiencies achieved by oxygen enrichment. For example, the results show that air enrichment boosts conversion of feedstock (at constant feed rate) from 60.6% at maximum blower capacity to 66.8% with the addition of 100 tons/day of oxygen. When fresh feed rate was held constant at 60% conversion, air enrichment produced an increase in throughput from 22,500 bbls./day with air alone to 25,976 bbls./day with an added 100 tons/day of oxygen.

Extrapolating these results, the company estimates that oxygen additions of up to 300 tons/day in excess of maximum blower capacity would boost conversion at constant feed rate to 76.4%, or increase throughput at constant conversion to almost 33,000 bbls./day.

Cost Considerations: As Cities Service is quick to point out, these processing advantages must be economically justifiable, i.e., they must more than offset the problems involved in using oxygen. The disadvantages that become immediately apparent, says the company, are the cost of oxygen and the loss of cooling effect of nitrogen normally supplied by an air-blower system. Because the energy requirement for oxygen production is greater than for the supply of combustion air by blowers, the use of oxygen enrichment must be justified on the basis of other cost considerations. For example, tax structure and the availability of capital may make the increased cost of oxygen more attractive than a substantial capital investment in new blower equipment. Or the required increase in capacity may be of a temporary nature, in which case the permanent addition of blower capacity to fill a short-term need would not be justified.

Future Changes: The high coke-burning efficiency at reduced vapor velocity in the regenerator may alter present concepts of catalyst regeneration, says Cities Service. Temperatures in the regenerator are determined by the coke level at a particular time and by the control conditions of the catalyst cooler. But with an increase in oxygen enrichment, a trend toward reduction of temperature differential across the entire bed was observed during tests. Likeliest cause for this decrease in bed gradient is the increase in coke-burning rate at the initial point of contact.

With further pilot-plant work, says Cities Service, thermodynamic considerations may show that combustion equilibrium may be shifted toward better equivalent air utilization by injection of steam, oxygen and even possibly carbon dioxide into the combustion air stream. At any rate, these considerations—and more—will be the subject of much additional investigation in what looks to be a major breakthrough in catalyst regeneration technique.



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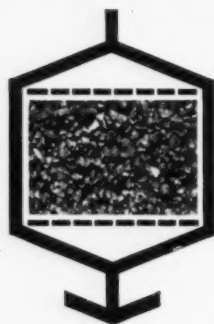
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ENGINEERING

Spray-Dried Ceramics

To solve some knotty problems of quality control in the processing of ceramic powders for pressing, Minneapolis-Honeywell has replaced its earlier oven-drying operation with a new spray-drying installation. In the more than 125 research and production runs that have been made to date, the spray-dryer has provided not only the hoped-for improvement in product uniformity, but also substantial reductions in the labor requirements of the operation.

Products handled in the drying operation are 55-65% slurries containing from 3-13 ingredients. Materials range from 100% clays to 100% non-plastics. In the older labor- and time-consuming oven-drying operation, problems such as the floating out of binders, other irregularities and segregation were commonly encountered. And the final product obtained by breaking up the oven-dried cake showed considerable variation in particle size and shape.

The spray-dryer—a 4½-ft.-diameter, stainless steel unit engineered especially for ceramics processing by Bowen Engineering Inc. (North Branch, N.J.)—minimizes such variations in product composition, size and shape. As a result, spray-dried materials can be pressed at a considerably lower compaction ratio than that required for pressing material of widely varying particle size. This leads to additional savings in the quality control of the pressed parts. For example, only the first several parts pressed from powder, such as zircon, have to be checked for tolerances. If these meet specification, M-H engineers can be almost certain that the remainder of the run—up to several thousand units—will also meet the rigid standards. This feature alone is considered the major advantage of spray-dried ceramics, even overshadowing the other savings in direct processing costs.

PROCESSES

Cold-Soda Pulping: The Black-Clawson Co. (New York) has developed a new cold-soda pulping system said to require low power consumption to produce high-quality pulp from hardwood chips. Estimated power consumption for defibering: about

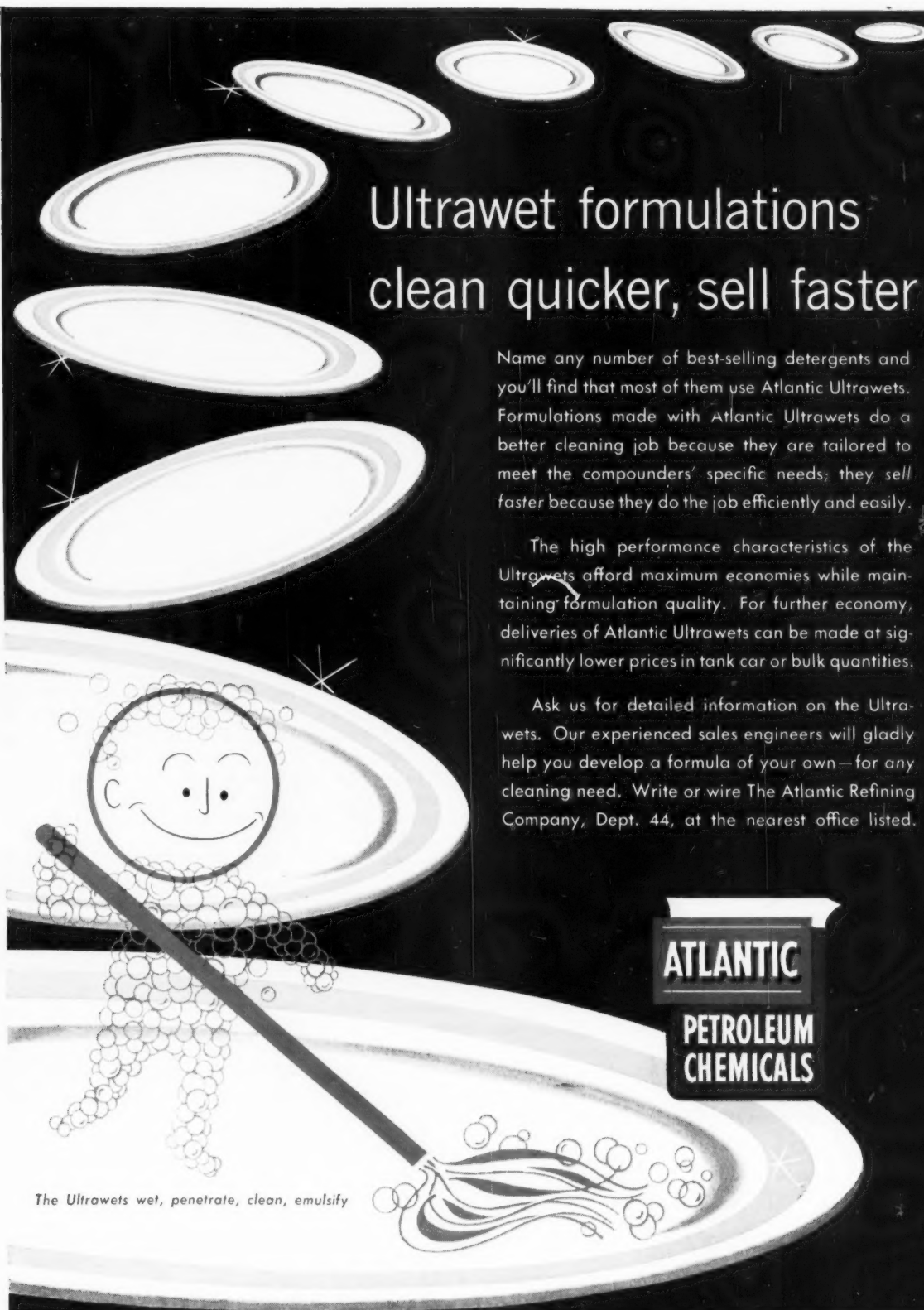
4 hp.-days/ton. Tests conducted in B-C's commercial-scale pilot plant at Berlin, N.H., indicate that pulp made by the process is well-fiberized, that strength equivalents range from softwood groundwood to more than hardwood sulfite.

A key component of the system is B-C's newly developed Chemifiner—a rotating-disc pulp-treating machine featuring slow-speed operation. It is said to provide powerful defibering action without loss in freeness or fiber length.

Uranium Tetrafluoride: Deutsche Gold- und Silber - Scheideanstalt (Frankfurt, Germany) has developed a method of producing nuclear-grade uranium tetrafluoride continuously from uranium oxalate. As described in German patents 1,018,405 and DAS 1,037,437, wet uranium oxalate is heated in a rotary kiln to 550 C in a hydrogen atmosphere. After all the steam and carbon dioxide have been removed, hydrogen fluoride containing 25% hydrogen is passed through the kiln. A second kiln, operating under the same conditions, uses the exit gases from the first kiln, boosts hydrogen fluoride utilization to about 80% of input. Product is water-free uranium tetrafluoride in 100% yield, based on the oxalate. Advantages claimed over production from the oxide: continuous operation, higher yield, faster reaction and ability to use wet starting material.

Process Studies: Armour Research Foundation (Chicago) has a highly versatile \$200,000 pilot plant that's now available for a variety of process studies. Among the processes that can be evaluated: hydrogenation, alkylation, oxidation, polymerization, hydration and hydrogenolysis. Studies of catalyst activity and catalyst life can also be carried out. Physical limitations of the pilot plant are: liquid feed of 1-50 lbs./hour at 0-4,000 psig., gas recycle of ½-1,000 standard cu. ft./hour at 0-3,500 psig., reaction conditions of 200-2000 F and 0 to 3,000 psig.

ARF points out that the elimination of capital expenditures allows a company to charge its pilot-planting off as a current expense that is "only slightly more than equivalent laboratory investigations." Arrangements can be made for company personnel

An illustration on a black background showing several clean, white plates floating in the air, some with a single sparkle. In the foreground, a large white plate is being cleaned by a smiling, anthropomorphic sponge character. The sponge has a round face with eyes and a smile, and its body is composed of many small circles representing bubbles. It holds a long-handled brush. Bubbles are also shown being scrubbed off the plate by the brush.

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ENGINEERING

to assist in operating the pilot plant and evaluating the data obtained.

Heavy Water: Egypt plans to join India (*CW*, Nov. 1, '58, p. 83) in the ranks of the world's heavy water producers. The Egyptian Atomic Energy Commission and the state-controlled Kima Chemical & Fertilizer Co. will be partners in setting up a 20-tons/year plant at Aswan. Power will be supplied by the Aswan Dam, and a fertilizer plant being built there by Kima is the likely source of hydrogen. The process the plant will use has not been made known, but firms throughout the world have been invited to submit bids to supply heavy-water and hydrogen extraction equipment.

Nangal Fertilisers & Chemicals (Private) Ltd., which has a 14-tons/year plant under construction at Nangal, India, has chosen the hydrogen distillation process offered by Gesellschaft für Linde's Eismaschinen AG. (Höllriegelskreuth bei München, West Germany). The Linde process is used in Farbwerke Hoechst's 6-tons/year plant at Frankfurt, West Germany (*CW*, Dec. 13, '58, p. 32). With the help of low-cost power from Bhakra Dam, the Nangal plant is expected to produce heavy water at a cost under the current \$28/lb. price set by U.S.'s AEC. Vitro Engineering Co. (New York) is technical consultant for the entire project, with responsibility for the over-all engineering of the job.

Hydrogen Peroxide: Deutsche Gold-und Silber-Scheideanstalt AG. (Frankfurt, West Germany) has an improved process for making hydrogen peroxide by anthraquinone oxidation. Key: using as solvent a methyl substituted-aromatic ketone. As an example, Degussa cites the hydrogenation (in the presence of a palladium-aluminum oxide catalyst) of 2-ethylanthraquinone dissolved in *p*-(*t*-butyl)acetophenone. Air oxidation of the reduced quinone followed by water extraction produces the starting material plus a 20% solution of hydrogen peroxide (by reduction of the oxygen).

Mixed Hydrides: A wide variety of processes that can be carried out with complex hydrides is described in "The Mixed Hydrides" by Dr. Mark Rerick, University of Notre Dame, and pub-

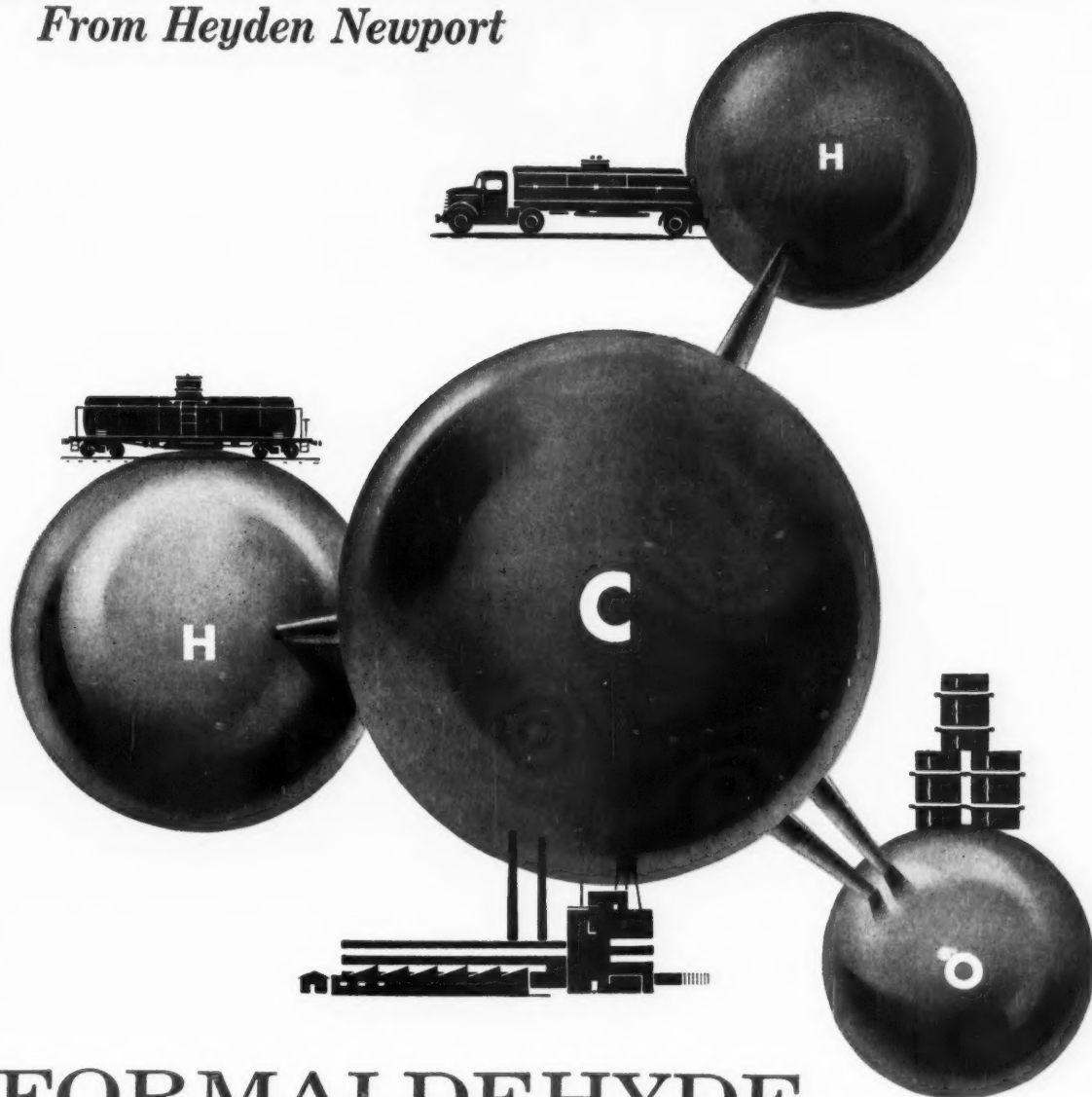
lished by Metal Hydrides Inc. (Beverly, Mass.). The term "mixed hydrides" is used to denote systems involving complex hydrides and other reagents, such as chlorides of lithium, aluminum, boron, magnesium and calcium. Among the unusual reactions summarized: stereospecific reductions, specific reduction of one functional group in the presence of other reducible groups, hydrogenolysis of unsaturated ketones to olefins, ether cleavages, hydrogenolysis of alkyl halides, hydroboration reactions.

Alcohols: Farbwerke Hoechst AG. (Frankfurt, West Germany) has a preliminary patent (DAS 1,035,632) on a novel method to make ethanol and isopropanol. Ethylene or propylene is absorbed by 68-72% (by weight) sulfuric acid in a tantalum-plated countercurrent column at 20-40 atm. and 140-160 C (for ethylene) or 70-110 C (for propylene). Then water is added in an equal amount to the alcohol concentration—7% for ethanol or 20-30% for isopropanol. The alcohol is recovered by vacuum stripping in two stages, giving concentrated alcohol in the first, low concentration in the second operation. Total yield of alcohol is over 96%, based on the starting olefin. The sulfuric acid leaving the process is at nearly the same concentration as the input acid, thus doing away with costly reconcentration.

Modified Fluorocarbons: Radiation Applications, Inc. (370 Lexington Ave., New York) has developed a process to modify fluorocarbons by radiation grafting to make them easy to bond and surface-dye. The process is claimed to reduce the cost of modifying fluorocarbons by 25%. It eliminates the need for postfabrication modification, previously needed to make the fluorocarbons bondable. And the technique will allow both Teflon and Kel-F to be surface-dyed.

Concrete Mixing: Lengthening the time in mixing concrete has been found to result in considerable cement savings by Israel Institute of Technology (Haifa). Increasing the mixing time from under ½ minute to 1 minute gives an average saving of nearly 2 lbs. of cement/cu. ft. of concrete. The strength of the concrete is said to be unimpaired, while its uniformity is improved.

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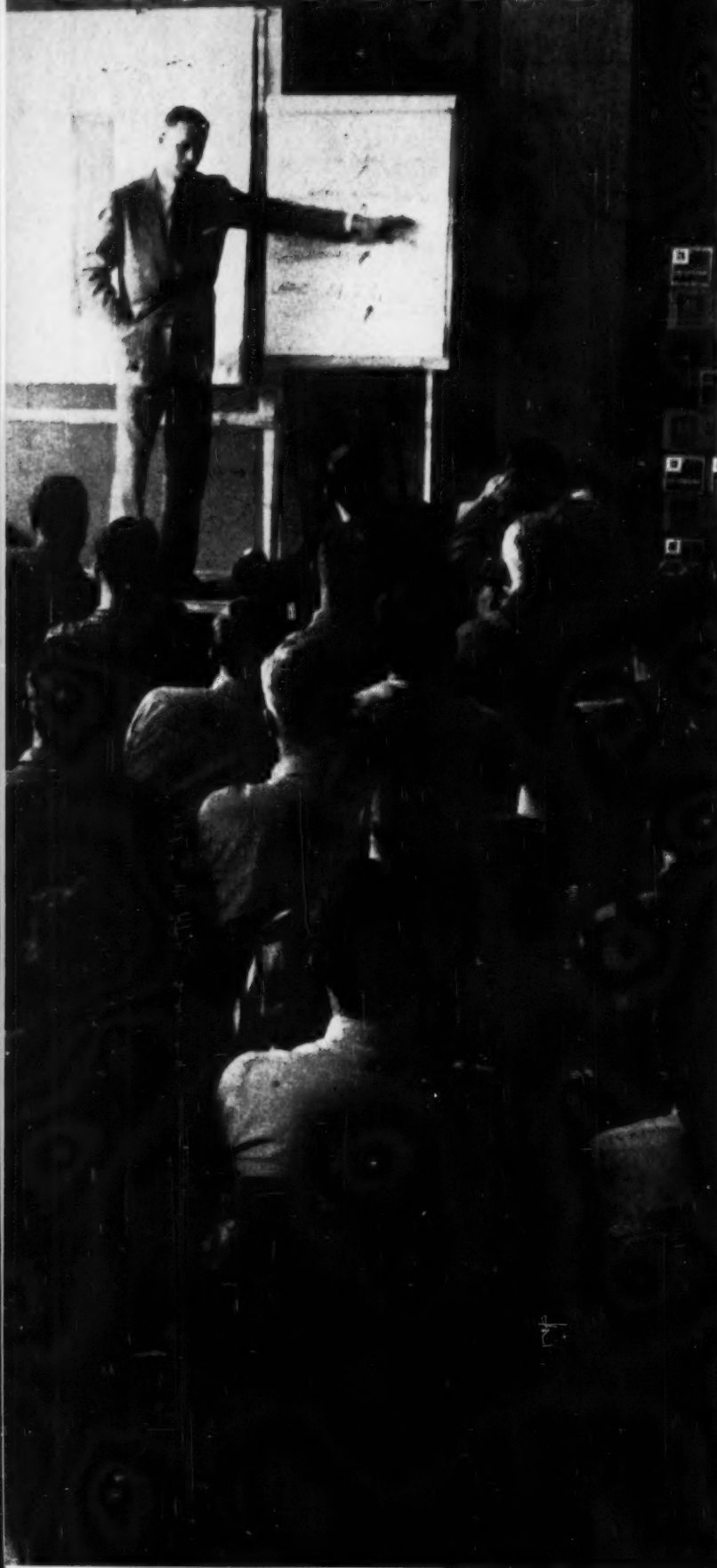
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PRODUCTION



Everybody

The photos on these pages show how Ansul Chemical Co. selects its foremen. It's a method developed by boldly rewriting a page from a Navy wartime plan. The novelty: the full shop crew evaluates and votes on qualified candidates; management makes the final selection. A job review, completed last week, shows the result: men chosen by the plan turn in top performances.

The program, now in use company-wide, began several years ago when Ansul needed two new foremen in its mechanical division. President Robert Hood was concerned about the yardstick being used to measure men for these jobs (he was dissatisfied with the methods of selection, not the men picked for the jobs).

Hood called together members of management to discuss methods of selection. They were Arthur Pope, then vice-president of manufacturing (now retired); Clifford VanderWall, now vice-president of manufacturing; T. K. Christianson, mechanical division general manager; Robert De Temple, mechanical division production manager; Raymond Twining, personnel manager; Richard Drebus, training manager.

The Man Between: All agreed that a foreman's job is in many ways the toughest in the plant, that it is the balancing point, that a foreman is effective in direct proportion to his ability to do two separate tasks—represent management to workers, and workers to management. Actually, he's not a member of either group. Organizationally, he's a member of management; psychologically, he's not. And, he's had to turn his back on some of the camaraderie he shared when a worker.

Yet, Ansul found that just three characteristics were being considered in determining if a man qualified for foreman: (1) Was he a top producer? (2) Did he try to mirror management's thinking? (3) Did he get along well with everyone?

None of these types necessarily

Ansul's VanderWall briefs workers on evaluating the foremen's jobs.

Helps Pick the Foremen at Ansul



Foremen themselves discuss selection program before voting, gain clearer view of qualities of leadership required.



Group discussions aid committee in pooling workers' selections. Management makes the actual decisions.

Workers find that picking foremen is a serious job, no popularity contest.





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PRODUCTION

become effective foremen. The Ansul group decided it had to determine more fully what abilities and characteristics were needed for the job, and how to actually measure potential foremen against their new set of requirements.

Hood felt there should be some way to get more opinions on who should fill the jobs. And one member of the management group remembered the Navy's air crew plan by which group leaders were chosen.

Voice of the People: Ansul's version of the plan has six phases—three that precede the actual selection of foremen, the selection, two others. And, in two key phases, it draws on the previously untapped opinions of workers and foremen.

First, management, foremen and workers attempt to define a foreman's duties and responsibilities and the skills or personal qualities needed to carry them out.

As first tried out in a 125-man division, the initial step included bulletin board announcements, briefings of foremen and workers and a division-wide meeting. Then each group of workers met with its foreman, discussed the foreman's duties in detail. Next step, each worker made a list of his interpretations of the foreman's duties and qualifications, turned it in, unsigned, to the personnel department. Personnel tabulated the qualities, came up with a composite picture, then did the same thing with lists from foremen and management.

In the second step of the program, a management committee consolidated the three lists.

Side Reaction: By this time, the program had produced an important side result: employees were able to appreciate the many facets of the foreman's job. Ansul feels this has helped smooth relations if a worker becomes embittered by failure in his quest for the job. In fact, a number of veteran employees who were candidates for foreman jobs asked to be removed from consideration after the discussions of duties and qualifications of foremen.

Printed lists of specific characteristics by which to judge a man for the job were then distributed to each member of the division, along with the names of the qualified workers in the division. Each division member selected the five men

who most nearly matched the yardstick.

The fourth phase of the program—management's actual selection of the foremen—followed. And the final phases—training and evaluation of the periodic ratings of foremen's performance completed the program.

Not Self-Evident: Ansul's management points out that while the voting is helpful, it doesn't necessarily make the selection of foremen self-evident. The voting procedure doesn't mean management abdicates its responsibility of selection. Other factors such as seniority, work records and health have to be considered. For example, in the first voting two of the five men among those who received the highest votes were eliminated because of health.

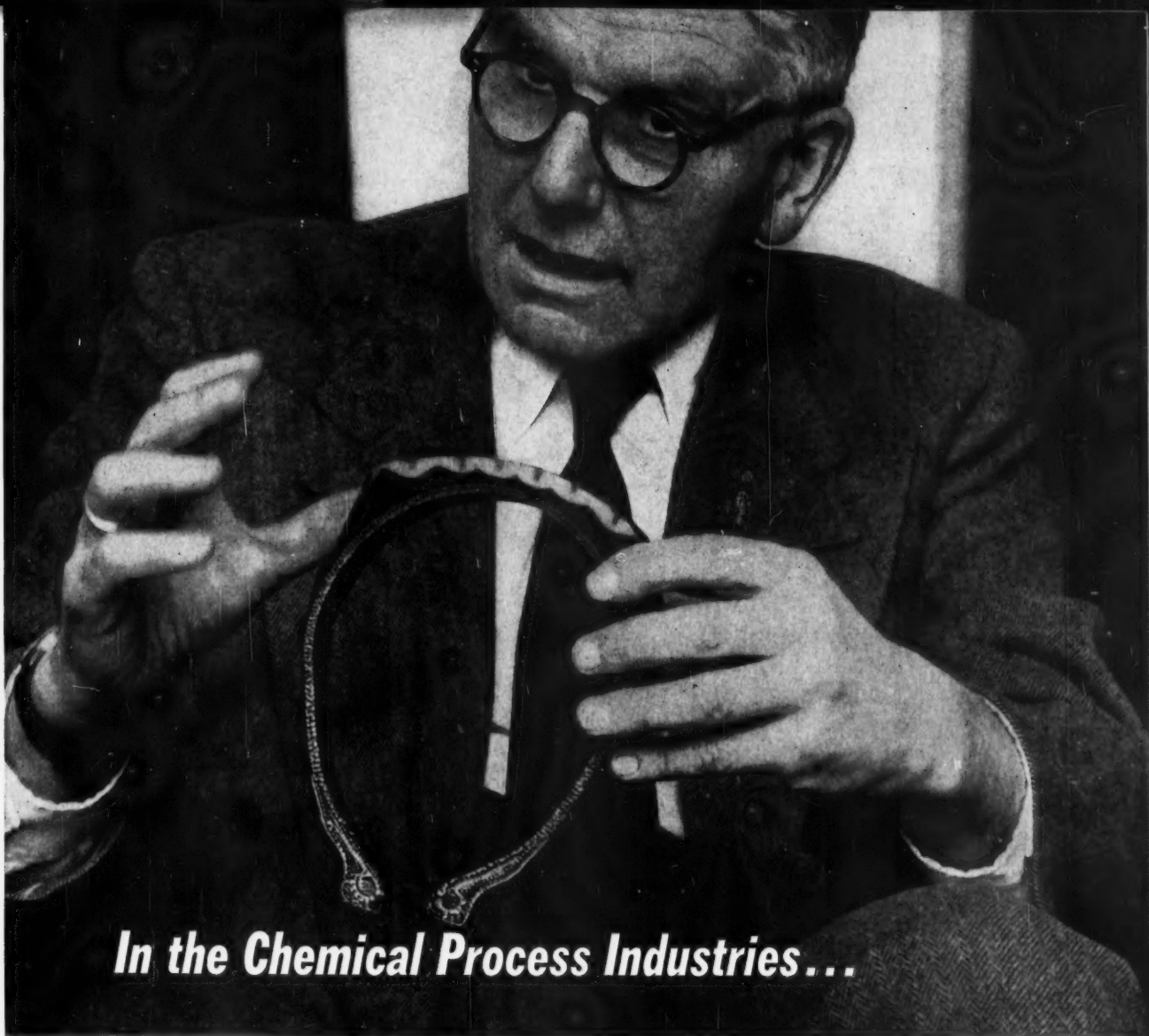
Nevertheless, the voting does serve to reinforce management's evaluations. It often brings to management's attention men with potential as foremen who might otherwise have been overlooked. And, it creates a pool of candidates for future openings, saves time in making selections.

Each of Ansul's three divisions has adopted the foremen selection program. And the company feels that the technique could be applied to positions other than foremen. This confidence is based on results already achieved.

EQUIPMENT

Fire-Retardant Paint: A new paint that acts as a fire-stopper and insulator has been developed by Baltimore Paint & Chemical Corp. (Baltimore) and is now being distributed by Alim Corp. (11 Park Pl., New York 7). Called Saf, the new paint contains newly developed resin pigments that react to flame by puffing out into an insulating foam. At 1700 F, Alim says, the painted surface forms a fire-resistant mat more than an inch thick. Treated walls will withstand flames at this temperature for an hour; in a half-hour test, the temperature within a building was kept below 400 F.

Ductile Iron Products: American Cast Iron Pipe Co. (P. O. Box 2603, Birmingham 2, Ala.) is out with a new line of products made of American Ductile Iron, a new metal said to combine the corrosion resistance of cast iron with mechanical properties similar to those of steel. The new line



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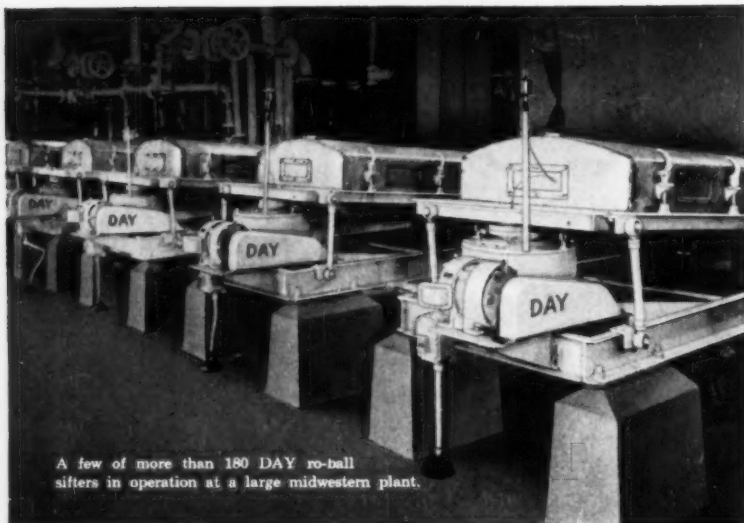
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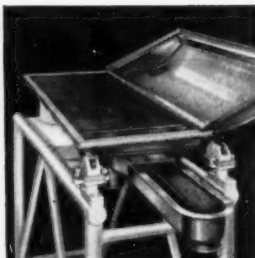
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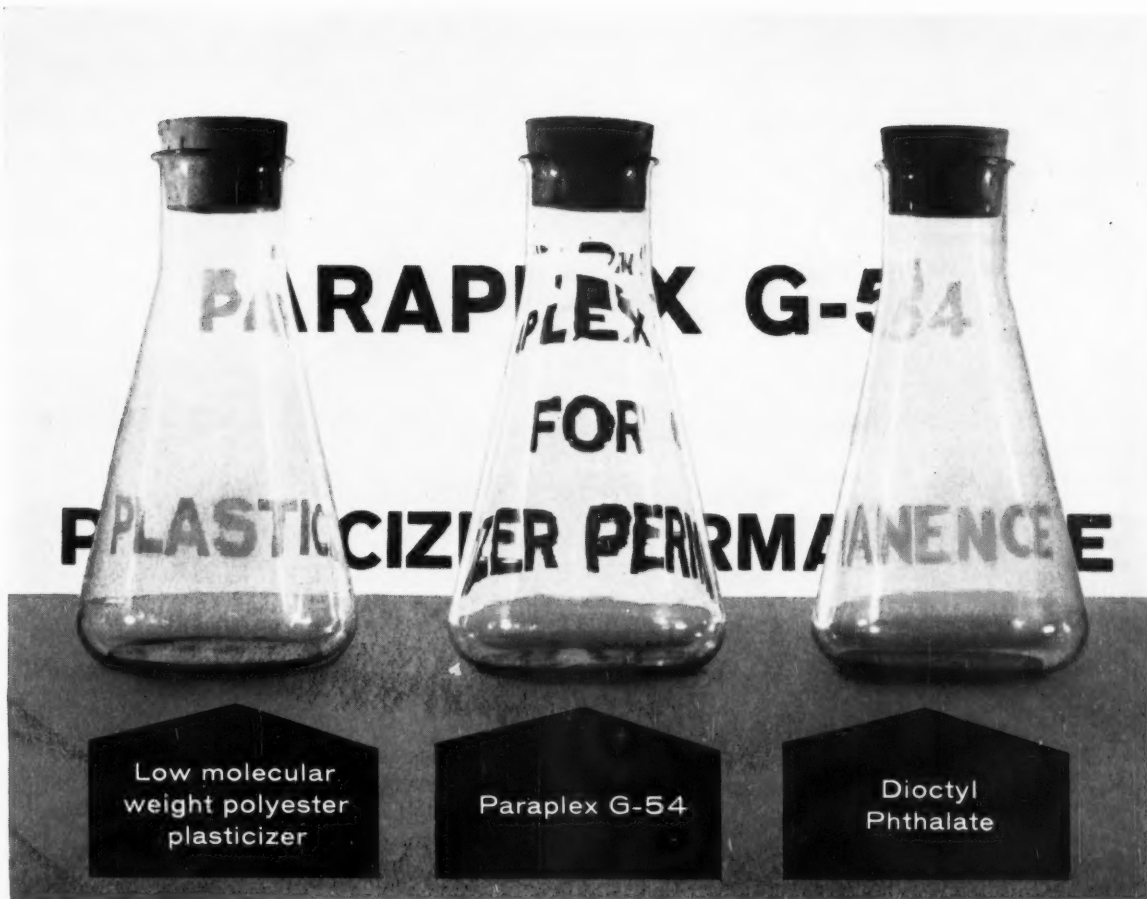
Metallic Seal: A metallic seal that withstands a wide range of temperatures at high pressure is a new product by Harrison Mfg. Co. (Burbank, Calif.). Called the "K" Seal, it has performed satisfactorily in tests at temperatures from -320°F to 1000°F , and in vibration tests of 2,000 cycles/second at 3,000 psig. The seals are coated with tin, Teflon, or gold (for applications over 400°F). They come in sizes to fit tubing with outside diameters ranging from $\frac{1}{8}$ -2 in.

Pressure Difference Switch: Barksdale Valves (5125 Alcoa Ave., Los Angeles 58) is now offering a new pressure difference switch for filter installations. When a filter becomes clogged, the pressure drop—as low as 10 psi. in a 5,000-psi. system—trips the switch, which actuates a warning circuit. The switch is applicable to oil systems ranging from 50-6,000 psi.

Air Sampling Pumps: Gelman Instrument Co. (Chelsea, Mich.) is out with two new pumps, PV-15 and PV-16, for sampling air in pollution and plant safety studies. Capacities of the pumps are, respectively, 2 cfm. and 4 cfm. Prices are \$69 and \$99.

Inside Job: A new scaffold designed for working inside spherical tanks is being introduced by Atlas Industrial Corp. (849 39th St., Brooklyn 32, N.Y.). Main unit of the scaffold is a vertical column of uniform diameter secured to the top and bottom of the inside of the sphere. The platform for the workmen is attached to a revolving ring, which is moved by hand, electric or air power up and down this center column. The platform telescopes to fit within the varying diameters of the sphere at different levels. All-welded steel scaffolds of several capacities—500 to 1,500 lbs.—are offered.

Brazing Kit: To simplify production-line tests of silver brazing, Fusion Engineering (17921 Roseland Ave., Cleveland) is now offering a kit containing three separate silver-brazing pastes. Kit price: \$15.



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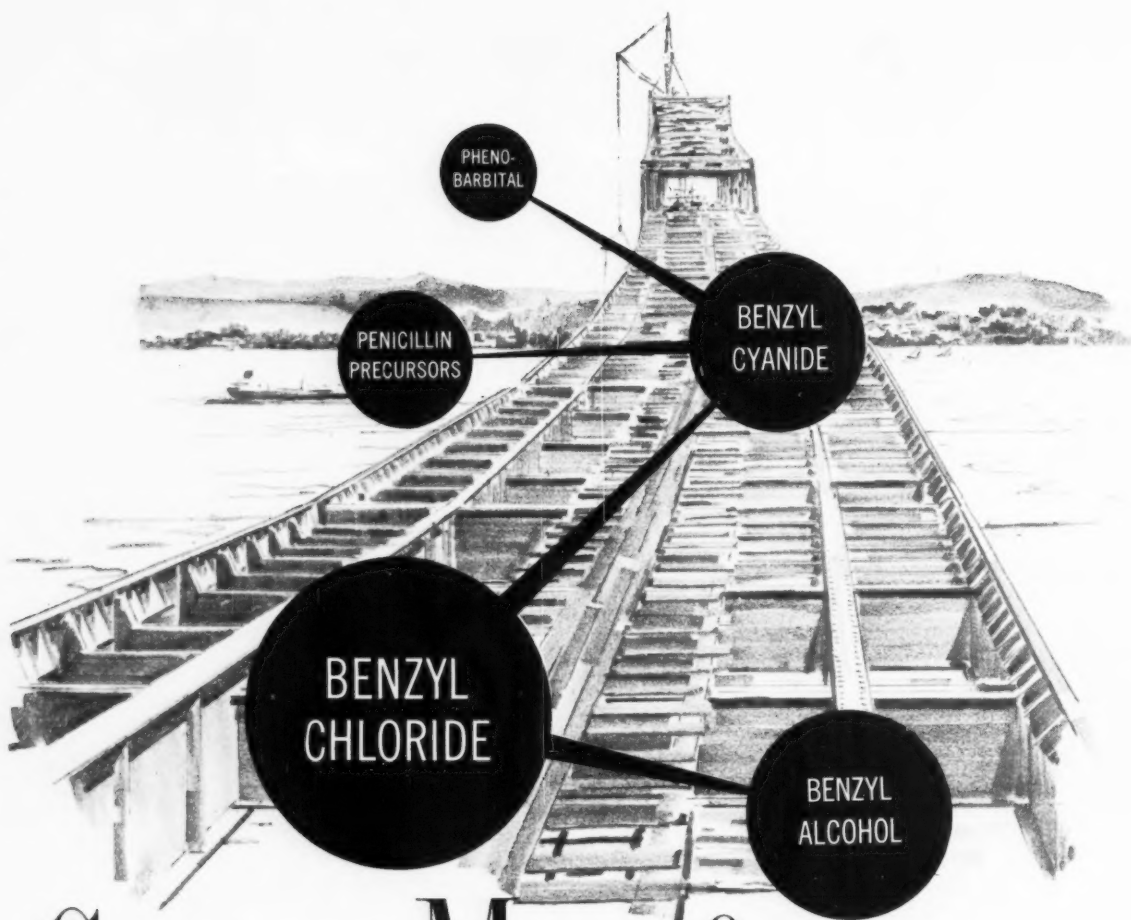
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See Chemical Materials Catalogue listing on page 122

Technology

Newsletter

CHEMICAL WEEK
February 7, 1959

A direct route from coal to halogenated hydrocarbons is under development at the British Coal Utilization Assn.'s laboratories (Leatherhead, Surrey, England). The process involves treating low-grade coal with gaseous chlorine trifluoride that has been diluted with nitrogen. This is the first time, say CUA researchers, that stable, transparent oils have been made from coal at ordinary pressures in a single process.

Chief product is an oil containing about 25% carbon, 65% fluorine and 7% chlorine. It has a wide boiling range—with about 80% of the product falling into the 150-350 C range. Lesser quantities of thermoplastic resin and some material of a waxy consistency are formed as coproducts. The gaseous reaction products haven't been investigated, but they're believed to contain low-molecular-weight chlorofluorocarbons similar to those used as refrigerants and aerosol propellents.

Properties of the fluorinated coal products—marked thermal stability, chemical inertness, nonflammability, high density, low surface tension and low refractive index—are similar to those of perfluorocarbons. They are also extremely hydrophobic. Potential uses for the new products include: high-temperature lubricants, heat transfer media, dielectric fluids, hydraulic fluids and surface coatings.

To date, coal fluorination at the Leatherhead laboratories hasn't reached the pilot stage; quantities involved have been too small to indicate the method's chances of economic feasibility. U.S. processing companies are keeping a watchful eye on the British project, but feel it would have a slimmer chance of success in this country. Reasons: process may be expensive and difficult to control; petroleum starting materials are plentiful in the U.S. However, the process may become a useful aid to Britain's program for upgrading dwindling coal supplies to replace even scarcer petroleum raw materials.

•
Britain will abandon another approach to coal utilization when the contract on the National Coal Board's underground gasification project at Newman Spinney expires this summer. The project has been aimed at utilizing thin, faulted coal seams that can't be mined. It was set up in March '57, was originally intended to produce fuel gas for a 60-mw. power station to be built in '60. The tests have already cost more than \$4.5 million, says NCB, and "commercial prospects do not justify further expenditure."

•
A new, natural source of tranquilizers? Roots of the Hawaiian holei tree (botanically known as *Ochrosia sandwicensis*) yield an alkaloid mixture reported by University of Hawaii researcher Paul Scheuer to have tranquilizing properties. Although the holei tree is a close relative of the rauwolfia bush—only natural source of tranquilizers (e.g., reserpine) currently being utilized—its alkaloids are different. The university's chemists

Technology

Newsletter

(Continued)

have turned up seven holei alkaloids (there may be more), are now trying to pinpoint the tranquilizers.

A project aimed at harnessing radioactive strontium-90 for useful power generation was unveiled last week by the Nuclear Division of The Martin Co. (Baltimore, Md.). Goal: a 100-watt radioisotopic generator employing the thermoelectric generating principle successfully demonstrated by the SNAP-III device (*CW Technology Newsletter*, Jan. 24) developed by Martin for the Aircraft Reactors Division of AEC. The proposed system will use more than 200,000 curies of strontium-90, is expected to have useful service life of about 10 years (based on strontium-90 half-life of 28 years).

Here's a new approach to raising plastics' temperature resistance—radiation-induced grafting of metallic salts and organometallics to organic polymers. It will be tried by Radiation Applications, Inc. (New York). Under sponsorship of the Office of Isotopes Development of the U.S. Atomic Energy Commission, RAI will investigate various types of grafts, kinetic and thermodynamic factors involved in the process, graft mechanisms, and measurement of the physical properties of the metallic graft polymers.

Modernization will cut about 500 employees off the present labor force (3,500) of Du Pont's Belle, W. Va., plant. The complete revamp of processing facilities at Belle cost several million dollars over the past three years. The rebuilt processing units will require about 250 fewer operating personnel; the plant's construction force will be reduced by about the same number.

Electron-beam welding moved a step closer to commercialization this week as Stauffer-Temescal Corp. (Richmond, Calif.) disclosed plans to soon start marketing its new welding units. Claimed advantages over present arc-welding methods: (1) distance between cathode and work is less critical; (2) power can be closely controlled and regulated continuously from zero to maximum; (3) welding under high vacuum (typical pressure is 0.1 micron mercury) produces completely dense welds; (4) unit can handle reactive, high-melting-point metals such as molybdenum, columbium, tantalum and beryllium.

Initial applications of electron-beam welding are expected to be found in critical missile and atomic energy installations. Cost of the new welding system, says Stauffer-Temescal, now appears to be in the same range as that of present inert-enclosure welding.

The first commercial installation of the company's companion process—electron-beam melting (*CW*, Feb. 1, '58, p. 48)—will be made this spring at Wah Chang Corp.'s Albany, Ore., plant. The new furnace, rated at 225 kw., will be designed to handle continuous melting and casting of high-purity ingots, 6 in. in diameter by 4 ft. long, or refractory metals.



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This couple probably never heard of pentaerythritol (PE), but they know what they expect in decorative and protective values for appliance finishes.

To meet consumer requirements for beauty and long life is one reason why many research laboratories are investigating the use of PE for baked enamel finishes and other protective coatings.

Alkyd Report #4, from the Hercules coatings group, suggests the design of PE nondrying alkyd-amine finishes of improved properties with respect

to hardness, adhesion, chemical resistance, color stability, and gloss retention. The data, illustrating how these properties in the finished enamel are influenced by the use of pelargonic, caprylic, and lauric acid as the monobasic acid modifiers for the PE alkyds, will be of particular interest to the alkyd formulator.

A call to your Hercules technical representative will make available to you this and other reports on the usefulness of PE in industrial finishes.



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RESEARCH



Blood-pressure checks, bad news for more and more people over 40, symbolize growing drug challenge.

Pressure Mounts in Hypertension Research

Two new drugs hold forth the promise of help for the high-blood-pressure patient shown above. To pharmaceutical men, they also signify the rising pressure of research in a market that today is worth \$50 million/year in sales.

The new compounds are Singoserp, claimed to be the first man-made rauwolfia compound to go into commercial production, and hydrochlorothiazide, a greatly improved version of one of medicine's favored treatments. Ciba Pharmaceutical Products, Inc. (Summit, N.J.), is producing the synthetic rauwolfia (chemically, carbethoxysyringoyl methylreserpate). Ciba and Merck Sharp & Dohme will be marketing the other material (Ciba as Esidrix and MSD

under the tradename Hydrodiuril).

The superiority of these drugs shows up in two major areas: high potency and relatively few side-effects. Neither attacks the causes of hypertension; but they do relieve the symptoms, which now trouble an estimated 5% of the total U.S. population. (About 75% of known cases suffer from "primary" hypertension—for which there seems no apparent cause; the rest have hypertension that results from diseases such as kidney infection or stones.)

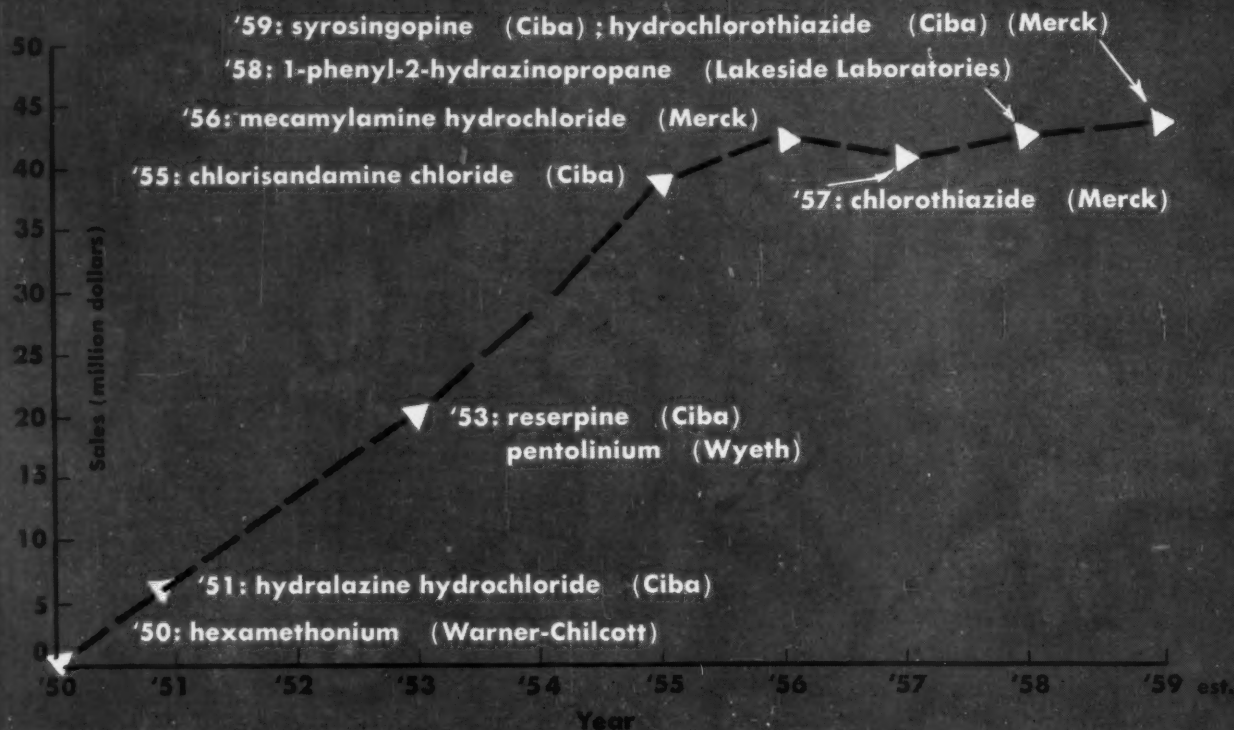
Rugged Road to Relief: Drugs are relative newcomers to the hypertension picture; the first specific hypertensive agent was introduced about 1950. Before that time, treatment was limited to diet, sedation and — in

some cases — surgery of the sympathetic nervous system.

Recently, chemicals (e.g., ganglionic blockers) have been found that affect the sympathetic nervous system much as surgery does. One is Inversine (3-methylaminoisocamphane hydrochloride), produced by Merck Sharp & Dohme. It is effective in oral form, gives reproducible and predictable results.

But ganglionic blockers are generally used on only the extremely severe cases of hypertension. A broad field is still open for drugs to treat milder cases. Over the years, hundreds of drugs have tried to fill this job, but relatively few have survived. Rauwolfia alkaloids (e.g., reserpine), among the early candidates, have

Hypertension Drug Sales Boosters



Total high-blood-pressure drug sales reflect boosts by drugs introduced in years shown.

proved helpful but sometimes cause unpleasant side-effects.

Lower Dosage: Ciba's Singoserp is an improvement on the rauwolfia antecedents. It not only can be used by patients unable to tolerate the natural rauwolfia drugs but also helps lower the required dosage of other antihypertensives, including ganglionic blockers.

Hydrochlorothiazide also increases the action of other antihypertensive drugs. It is 5-10 times more effective than chlorothiazide (6-chloro-7-sulfamyl-1, 2, 4-benzothiadiazine-1, 1-dioxide), from which it is derived. The latter compound, Merck Sharp & Dohme's Diuril, has become a leading antihypertensive since it became available last year.

Neither Singoserp nor hydrochlorothiazide is considered the ultimate in antihypertensives. Both require certain precautions. While Singoserp's side-effects are milder and occur less

frequently than those of conventional rauwolfia drugs, side-effects still must occasionally be reckoned with. They include nasal congestion, fatigue, nausea, etc. Hydrochlorothiazide must be used with caution in cases of disturbances of kidney and liver function.

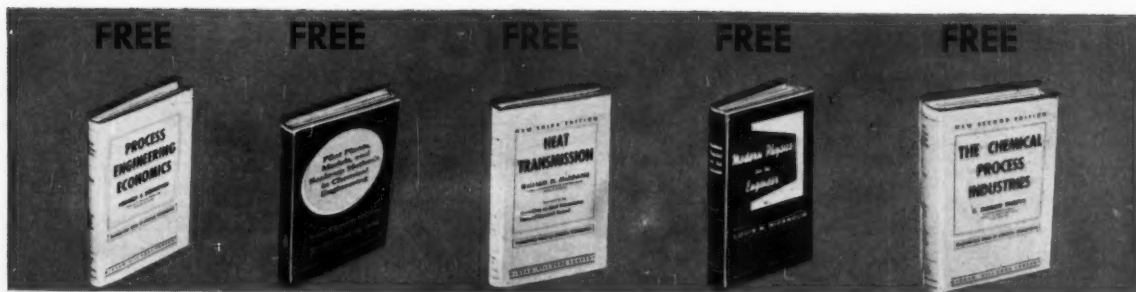
Who's Doing What? For those reasons, drug companies aren't letting up in their hunt for better antihypertensives. Lakeside Laboratories (Milwaukee, Wis.), for example, tells *CW* it is currently doing extensive screening of an "enormous series" of agents. In addition, it is studying the use of organomercurial diuretics in hypertension.

Recently, Lakeside unveiled Catron (1-phenyl-2-propyl hydrazine), a promising antihypertensive agent that acts as a monoamine oxidase inhibitor, canceling out the effect of substances (e.g., epinephrine) that cause blood vessels to contract. Blood flow is

eased, allowing blood pressure to drop. Catron seems to have the efficacy of ganglionic blockers but relative freedom from some of their drawbacks — such as causing dilation of pupils of eyes.

Cutter Laboratories recently started a research program on cardiovascular diseases in general, including work on antihypertensives. Although the firm has none on the market now, it has been looking at diammonio esters such as 3-(dimethylethylammonio) propionate diiodide for this purpose (British patent 764,141).

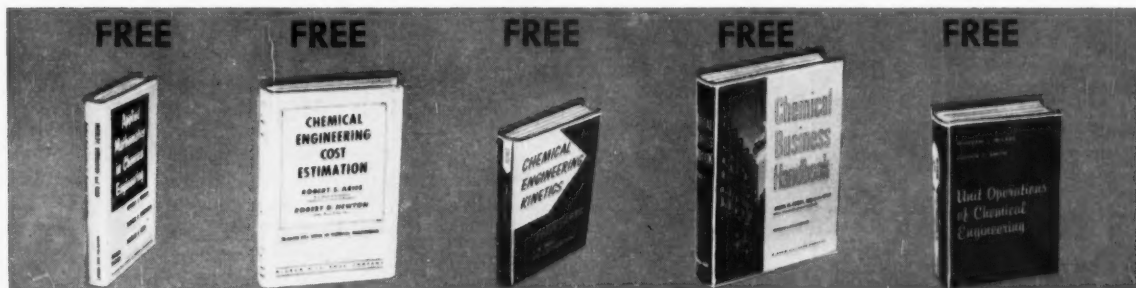
Central Effect: Abbott Laboratories (North Chicago, Ill.) is marketing a material called Harmony (a rauwolfia alkaloid). The company won't comment on possible new agents; but it leans toward research on drugs of the reserpine type, which act on the central nervous system and slow the pulse, as opposed to direct vasodilators, ganglionic blockers and adrener-



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RESEARCH

gic blockers. The latter reduce the effects of stimulant hormones by blocking them at the nerve endings. Behind the choice of reserpine-type drugs: they appear to offer fewer side-effects.

G. D. Searle (Chicago), Parke, Davis (Detroit), Lederle Laboratories division of American Cyanamid (Pearl River, N.Y.), E. R. Squibb division of Olin Mathieson (New York) and other firms report mild to active interest in drugs to lower blood pressure.

Interest will likely perk even more. For, as the number of adults over 40 increases, cases of hypertension and the market potential for drugs to combat it will rise correspondingly.

Lithium Cat Debut

This week, Lithium Corp. of America (Minneapolis) is launching the first of a new line of organolithium compounds designed primarily as olefin polymerization catalysts. LCA's first offering, available in experimental quantities, is n-butyl lithium. Next, LCA will make phenyl lithium for outside evaluation.

Some uses for the compounds include ethylene-propylene polymerization, isoprene polymerization, and in synthesis of organic chemicals, particularly pharmaceuticals.

While the cost of n-butyl lithium is now \$100/lb., it might drop appreciably in quantity production, according to LCA, possibly approaching the raw-materials cost of \$3-5/lb.

Manufacture of n-butyl lithium is relatively simple. Butyl chloride is added to a suspension of lithium metal in an inert medium (e.g., ether, benzene, heptane) over a 4-8-hour period. The reaction is vigorous and must be cooled; yield is 75-85%.

EXPANSION

• Midwest Research Institute (Kansas City, Mo.) has a \$10,000 grant from the National Science Foundation to extend its research on use of computers to disclose new applications for chemical compounds.

• American Cyanamid Co. Plastics and Resins division is now in full-scale operation at its new development laboratory at Wallingford, Conn.

• Glidden Co.'s (Cleveland) Chemicals-Pigments-Metals division

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will construct a \$1-million Inorganic Research and Development center at Baltimore, Md.

• **Budd Co.** subsidiary, Continental-Diamond Fibre Corp., will build a \$350,000 research laboratory at Newark, Del. The division's products include: laminated thermosetting products, bonded mica products, Teflon products.

PRODUCTS

• **Nitrile Silicones:** General Electric's Silicone Products Dept. (Waterford, N.Y.) now offers experimental quantities of a new nitrile silicone rubber, is scheduling two more varieties for marketing this spring. The current offering is NSR-X5602, a stock suitable for airframe seals, boots, etc. Coming: NSR-X8701, featuring high-temperature oil resistance; and NSR-X4803, a rubber having intermediate resistance to high-temperature fluids, and designed principally for oil seals for automotive transmissions.

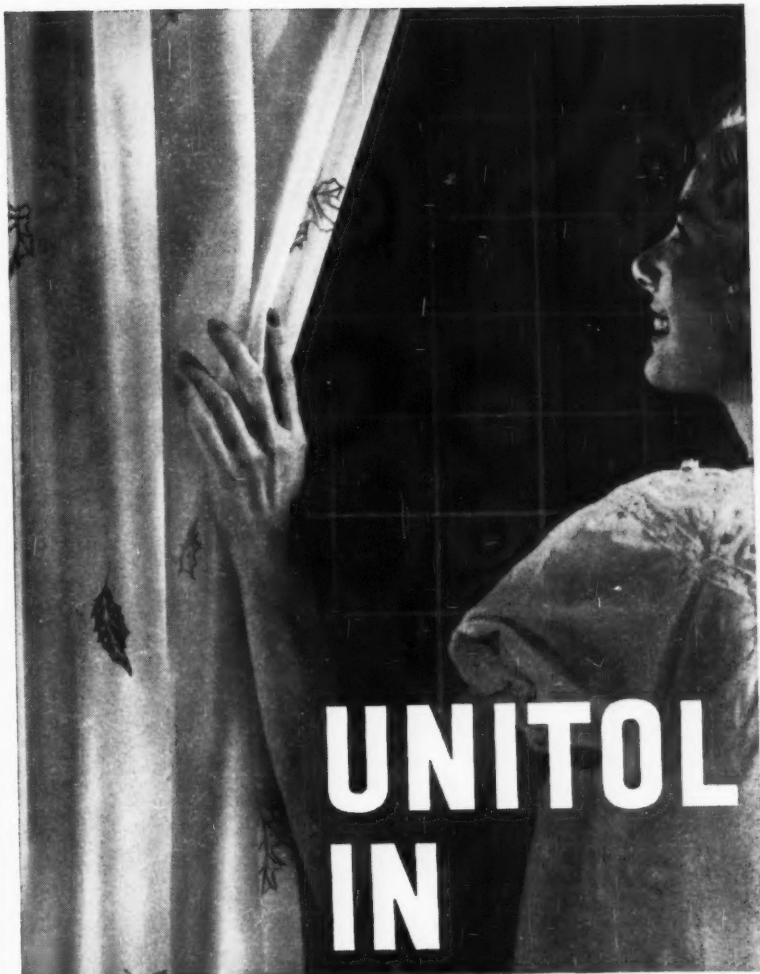
• **Hot Rock:** A new reinforced ceramic that withstands gas erosion at 5000 F for 60 seconds has been developed by Avco Research and Advanced Development Division (Wilmington, Mass.). Called Avcoite, it can be fabricated into rocket nozzles, used for other high-temperature, high-stress applications.

APPARATUS

• **Equation Predictor:** Graphic Calculator Co.'s (Chicago) is now offering a Graphic Chemical Predictor, which, the company says, will prognosticate the possibility of any of 10,000 chemical equations. It is in the form of a circular slide rule, costs \$1.95.

• **U.V. Microscope:** Bausch & Lomb Optical Co. has developed an ultraviolet microscope that reportedly allows a photomicrographer to visually focus an image using ultraviolet lights. It's made possible by an RCA-developed ultraviolet-image converter. Suggested uses: studies of synthetic fibers, petroleum products, pharmaceuticals, tissue cell screening. Price: \$3,250.

• **Combustion Capsule:** Laboratory Equipment Corp. (South Bend, Ind.) has developed a tin capsule for com-



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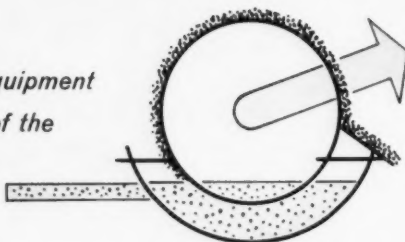
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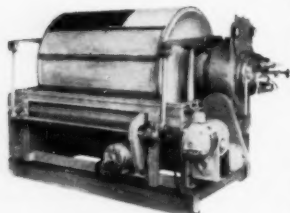
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Pick any processed material, from alcohols to zirconium, and it's dollars to doughnuts that somewhere along the production line there's a filter.

Keeping on top of the many demands made on filtration equipment by modern processing often presents some tricky problems. Take corrosive applications, for instance. With rotary drum type filters, usual practice calls for stainless steel or rubber-covered construction. Capitalizing on advances in materials of construction, our engineers recently developed a filter with all essential components fabricated from tough, glass-reinforced plastics. The plastic construction not only resists corrosion, but it is also lighter and lower in cost than comparable standard machines.



This new filter has been successfully tested in handling acid leach solutions in a uranium mill and is now offered as a regular component of the Dorr-Oliver line.

This development is quoted as another example of the many contributions made by Dorr-Oliver to increase the scope and versatility of filtration equipment. Actually, it's just about

impossible to think of any type of filter for any industry that isn't made by Dorr-Oliver and that hasn't been developed or improved by Dorr-Oliver engineers.

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RESEARCH

bustion analyses. It may be used for both powder and liquid samples, reportedly eliminates possible loss due to volatilization of the liquid sample while on the balance pan. Sample and technical information are available from the firm's St. Joseph, Mich., plant.

Remote Pipette Controller: Machine & Instrument Design Corp. (New York) offers a new remote pipette controller designed for use with dangerous liquids; it eliminates manual contact with the pipette. The new device is easy to clean, accurately handles 0.1 to 5 ml.

Sterilizing Indicator: A new tape, blank at room conditions, reads "sterile" when autoclaved for 15 minutes at 250 F. It is sold by Professional Tape Co. (Riverside, Ill.), eliminates the need for close timing.

REPORTS

The following Atomic Energy Commission reports in the field of Chemistry are available from the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.:

- "A New Castable Polyurethane" (SCR-54, 50¢); "Magnesium Sulfate Chemistry and Technology: A Literature Search" (NLCO-755, \$1); "Measuring of Dispersion and Coalescence (Disengaging) Time: A Literature Search" (NLCO-753, 75¢); "Plating of Beryllium-Copper Components for Electrical Applications (Gold and Silver), (LA-2229, \$1.50); "Preliminary X-ray Investigations of the Hydrates of Zirconium Tetrafluoride" (IDO-14455, 50¢); "Preliminary Investigation of Isopropylated Terphenyl—A Potential Reactor Coolant" (HW-57400, 50¢).

The following report is available from the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D. C.:

- "The Zinc-Silver Oxide Cell Low-Temperature Operation Without Auxiliary Heating" (PB 131787, 75¢) reports four methods of eliminating polarization of the negative electrodes, a major cause of poor low-temperature performance of zinc-silver cells. All four methods are chemical treatments to remove the oxide film from the zinc plates.



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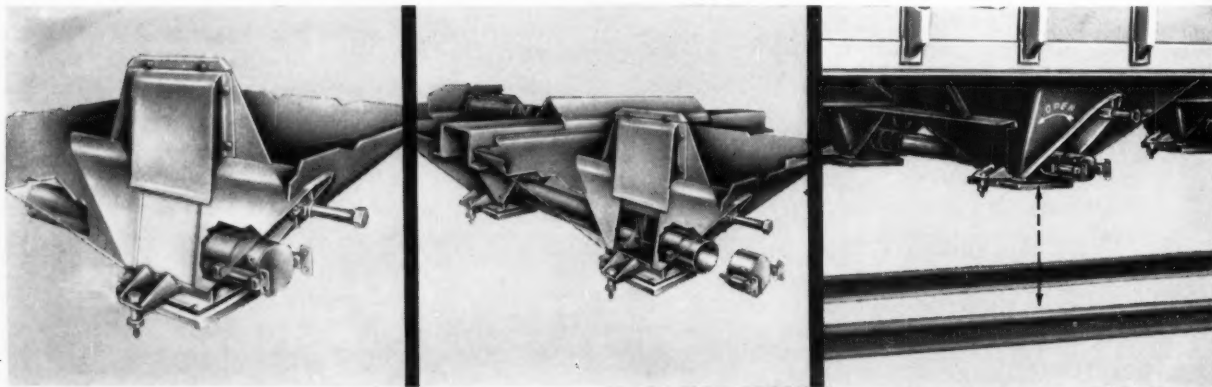
2. Gate valves open and close *vertically*, and are not subject to pressure of the load. Rate of flow can be

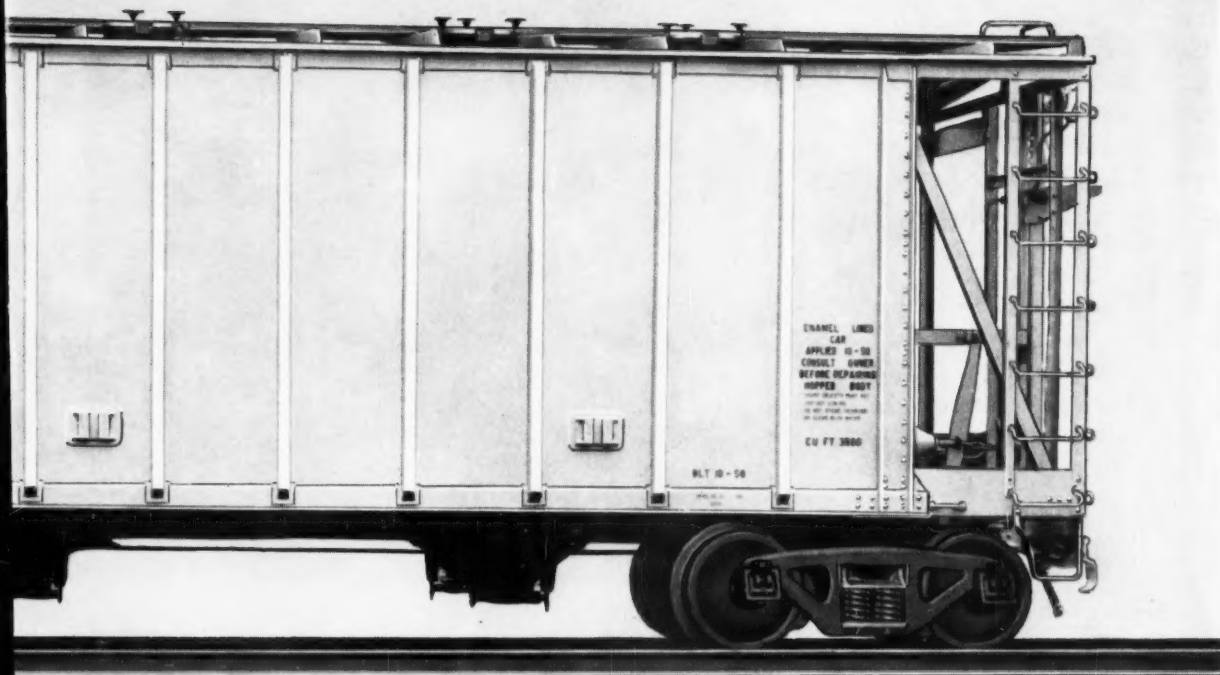
adjusted as required.

3. The DRY-FLO* car unloads easily, either pneumatically or mechanically. Only two nozzles are required for the car with 2450 cubic feet capacity, three for the larger car that holds

3500 cubic feet.

4. Once car is loaded and hatches sealed, no outside air can enter. For this reason hygroscopic materials shipped in Dry-Flo cars cannot pick-up moisture from external sources.





5. The DRY-FLO car provides considerably more clearance for unloading . . . permits use of all types of unloading equipment at rail siding or team track.

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ior car lines . . . provides a smooth, unbroken ceiling surface and eliminates hang-up points.

7. Hopper corners are rounded to a 21½" radius with no angular joints

. . . allow complete removal of product, make cleaning easier.

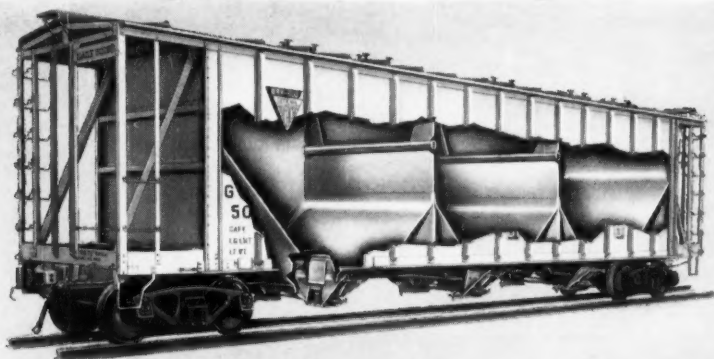
8. All-welded construction of the DRY-FLO* car makes interior coating easy when needed to protect cargo.

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Market Newsletter

CHEMICAL WEEK
February 7, 1959

"The price trend of sulfur is up, and within the next 6 to 12 months the \$3/ton reduction (made in '57) will be restored." This prediction, contained in a market survey by Harris, Upham & Co., is based on the "sulfur market's ability to assimilate the new Mexican tonnage." The report cites Texas Gulf Sulphur as the company that could "take the lead in restoring prices to their former levels"—just as it took the lead in cutting prices \$3/ton in '57.

Fact is, there's little chance of such a price increase. One industry spokesman points out: "It doesn't make sense" because the price of elemental sulfur must be set just above the prevailing tab on pyrites-derived sulfur, which, in effect, sets prices for the whole industry. An arbitrary boost of elemental sulfur prices would only widen the price differential, give pyrites-sulfur a greater competitive advantage.

Meanwhile, a Canadian sulfur plant has been closed down indefinitely because of continuing operating losses. It's Noranda Mines Ltd.'s plant at Port Robinson, Ont. The multimillion-dollar plant—which made elemental sulfur, sulfur dioxide, and sintered iron from pyritic ore—was put into operation in '54, when a scarcity of sulfur was anticipated.

Noranda's current troubles are blamed on competition from Mexican sulfur and byproduct sulfur from Canada's Western sour gas fields; Noranda spokesmen say the plant won't be put back into operation until Canadian pyrite can again compete with these other sulfur sources.

The U.S. will get its second isobutylene producer this week when Petro-Tex starts up its new plant in Houston, Tex. Esso has for years been the nation's only isobutylene producer. Petro won't reveal its new isobutylene capacity, but trade estimates put it at about 2 million gal./year.

Several factors spurred Petro-Tex's isobutylene move: (1) availability of a stream of isobutylene that could be purified "without much trouble and expense," (2) desirability of rounding out the firm's current market line of five olefins, (3) existence of a "well balanced market" for the chemical.

About 95% of all isobutylene is used in butyl rubber; this outlet, plus miscellaneous other applications, add up to a 30-million-lbs./year market, according to Petro-Tex spokesmen.

It's official now. Russia will restrict '59 tin exports to non-Communist countries (*CW Market Newsletter*, Jan. 31). Limit: 13,500 tons. This compares with 18,500 tons exported by Russia last year despite last-quarter reduced shipments due to import restrictions imposed by the United Kingdom, Holland, France and Denmark.

Market Newsletter

(Continued)

U.K. and Holland have now lifted quota restrictions; France and Denmark are expected to follow suit. Although the new trade pact between Russia and the International Tin Council is considered "far short of perfection," it's welcomed as a first step that could lead to Russia's full participation in the International Tin Agreement.

Meanwhile, Western Tin producers won't be caught napping. Says a British Board of Trade spokesman: "A close watch will be kept on shipments from other Iron Curtain countries"—just in case Russia tries to bypass the new agreement by shipping through its satellite countries.

The recent phthalic anhydride price slash (*CW Market Newsletter*, Jan. 31) continues to be reflected in prices set by consuming industries. A 1¢/lb. across-the-board cut of polyester resin tags by Reichhold Chemicals brings base prices on truck and carload quantities down to 33¢/lb.

Other polyester producers have either quickly followed suit or, early this week, told *CW* that they expected to make similar price adjustments to establish a firm, industry-wide price level.

At the same time, prices of alkyd coating resins were shaved ¼¢ to 1¢/lb., also because of lower phthalic costs. Reichhold's move on this item, too, is being followed by other producers.

New headaches are in store for nylon tire-cord marketers as Tyrex, Inc. (five producers of viscose rayon tire cord) embarks on its "second round of one of the biggest merchandising efforts in recent auto and truck tire-cord history." Elated by success of previous promotional campaigns to push viscose cord into the \$75-million/year tire-cord market (every auto maker reportedly offers tires made with Tyrex cord as original equipment on '59 models), the group will this year seek to dig deeper into the tire-cord market with a multipronged campaign that includes: an 83% increase of trade advertising space, 39 insertions in major consumer publications, spot radio pitches, extensive lab and road tests to pin down Tyrex performance ratings.

SELECTED PRICE CHANGES — WEEK ENDING FEBRUARY 2, 1959

	Change	New Price
UP		
Sodium phenolsulfonate, dms.	\$0.02	\$0.52
Tin (Straits)	0.125	1.01
Calcium phenolsulfate, dms.	0.10	1.24
Zinc phenolsulfate, N.F., gram., dms.	0.01	0.45
DOWN		
Carnauba wax, North Country No. 2, crude, bgs.	0.01	0.78
Naphthalene, refd., tanks	0.02	0.0975
p-Toluenesulfonamide, powd., dms., t. 1., works	0.10	0.60

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The puppet manipulators' role is intriguing but it may backfire.

Processors

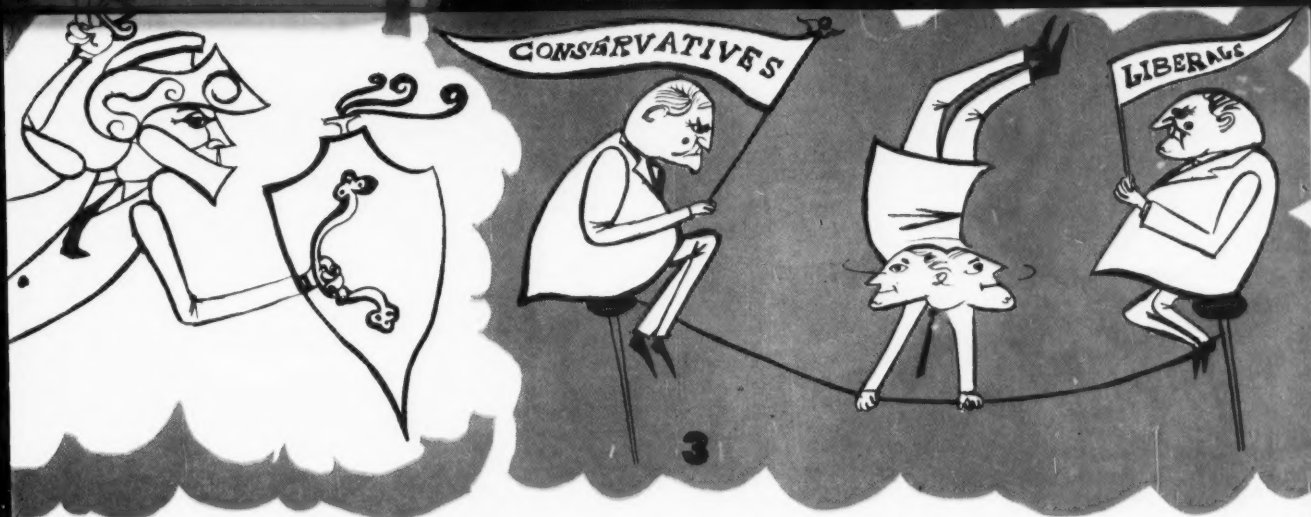
The latest election, the quickening Washington tempo as the new Congress buckles down to work, and the gathering strife over issues important to business — all these are forcing the chemical management man to ask himself, "What's my proper role in politics?" He may have visions of grandeur or nightmares of horror as he considers the question. But he can't ignore it.

To most management men, politicking seems rife with difficulties—whether in deciding to actively enter politics, choosing the objective of such activity, or settling on a plan of operation. Some phases may be a bit simpler than others; but for most companies, the toughest problem of all is fixing the aims of participation, once it's decided to try politics.

Indecision, Definition: True, CPI managers are seeking ideas — a spot-check of some 20 companies indicates they're all concerned with a need for making their voices felt. But only a smattering have reached the point of naming a committee or administrative group to set up a course of action.

One of their big problems: the widely varying definitions of political activities and purposes. Examples:

- "To do something to help [the state] take its rightful place in the sun by improving the business climate



Normally peaceable executives visualize being torn to shreds in the hurly-burly of the political arena.

Easiest way for some may be middle position, without the risk of offending either right or left.

Ponder Perils of Political Arena

... to the end that [the state] flourishes industrially and culturally."

- "To bring about a government in which elective and appointive officials have in mind the balanced best interests of all segments of the nation."

- "To influence the election and appointment of government leaders at all levels who understand the meaning of a good business climate."

- "To produce sound government economic policies."

- "To inform employees and stockholders on political questions."

- "To take an increasingly active interest in practical politics, especially in areas where [management] can oppose labor's mounting political power."

- "To elect the best-qualified men to federal, state and local offices, irrespective of party affiliations, so as to improve the country's business climate and economy."

Clearly, it would be difficult to organize a concerted CPI program based on purposes and definitions that range from outrightly opposing labor to fostering the "balanced best interests of all segments of the nation." Moreover, definitions cannot be uniform nor can they have the same scope. So it's apparent that they would have to fit the needs of each company, the personalities of its management and the extent of the company's relations with the government.

The definitions will likely get final

refinement only after many problems and courses of action have been considered.

It's the process of deciding on these courses of action that's the toughest phase for most chemical process management men. On this point, most managers, normally at ease in a wide range of business and social situations, visualize themselves as babes-in-the-political-woods.

Foremost fear seems to concern legal aspects of political activity—in such matters as leaves of absence, maintenance of pay and other job-security questions covered by law.

Another strong concern is the possibility of driving away customers by taking a stand on issues that affect the customers' business or that may conflict with customers' personal views. In the same category is the likelihood of dissension among stockholders if stockholder funds were used for partisan activities.

Also a big question: the effects that company politicking might have on employees. This might be either fear of antagonizing unions or hesitancy lest junior management feel bound to compromise personal views with company stands.

Perhaps as potent a problem as any is the constant threat of being "stigmatized" as a politician.

Troubles Discounted: But older and wiser hands who have been pioneering the political activity field for years discount the bases of many of

these misgivings. They hold that legal restrictions are small, largely because few precedents have been set. Reaction from customers, they say, is often one of respect engendered by the company's declarations of a positive point of view.

On the question of stockholders, they agree that education may well be necessary, but that much of the battle concerning expenditures outside normal company activities was won when management began distributing grants for research and educational programs. They also offer positive steps to mitigate worries about employee reaction.

More troublesome, say the pioneers, is premature action of companies. In the area of politics, the hazards of spotlighting a poorly thought out plan are confusion and irreparable setbacks.

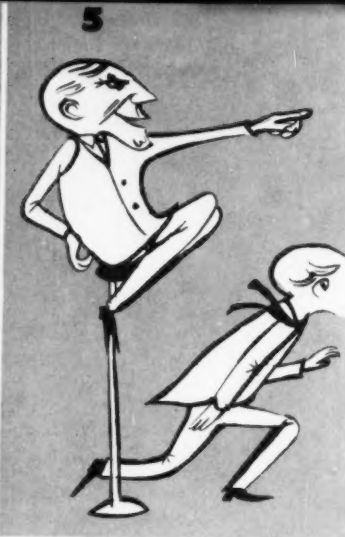
The pioneers also cite the lack of competent people to administer the program and to visualize its goals. In this area alone, they sometimes recommend the hiring of men experienced in quarterbacking political football games.

Action Areas: To help show the way around these real or surmised obstacles, a number of guideposts have recently sprung up. One, the just-released U. S. Chamber of Commerce program, "Action Course in Practical Politics," consists of nine 2-hour workshop sessions. Workshop participants consider actual case prob-

ADMINISTRATION



4 Ideal view is boss setting active example to his staff.



5 Some would prefer to put juniors on the job.



6 Minority says 'hands off,' lets things run naturally.

lems in practical politics, including studies of political organizations and nominating activities.

Similar to the commerce group's plan, and already tried, is "The Syracuse Plan" evolved by Syracuse, N.Y., businessmen.

Another group is the Effective Citizens Organization (ECO) in New York. It also provides workshop sessions and conducts them on the campuses of major colleges and universities, with men from the business community participating. In New York state, "Operation New York" (OPNY) is offering guidance to community leaders on how to make self-appraisals of community needs and how to take action on them.

In Rhode Island, too, business leaders can call upon the Employers Labor Relations Information Committee, Inc.

And out of the efforts of the General Electric Co. is a soon-to-be-published book called "The Businessman's Guide to Practical Politics."* Heartily endorsed by leaders of both major political parties, it's an attempt to provide down-to-earth, how-to-do-it help based on GE experience.

Outlook: There's no doubt that CPI management is earnestly looking into the need for political action. Some consider it pressing; many suggest that it's a program to be developed leisurely. Those who consider it urgent argue that it has taken 20 years for labor spokesmen to develop an organization effective enough to get labor-oriented legislators elected.

*By J. J. Wuerthner, Jr., Regnery, 235 pp., \$3.75.

They argue that business is already 20 years behind. Some argue for oftier goals than opposition to labor, but they too point out that business is still way behind. To clear away the morass of government red-tape and interference, they say, is at least a 20-year job that should be started now.

They feel that the so-called Sunday-school approach—in which company management makes platitudinous speeches calling for lower taxes, better business and a fair day's work from labor (as well as making time-worn exhortations that employees exercise their voting franchise) no matter for whom or what is outmoded and badly overworked. Instead, they say, management, first of all, needs to recognize that honest political action can bring benefits directly to the company, not only to the population at large. Once this fact is acknowledged, they say, management should set up goals for a political program and then establish a policy. Last, of course, management must see that the policy works.

The Vision: Despite these high-flown aims, procedures are slowly becoming discernible. Certainly each program would be developed differently to suit each company, but it's possible even now to make out some of the characteristics of a model policy:

- Nonpartisan activity based on issues, not on parties or candidates, and with definite company positions.
- Wide-ranging goals seeking moderation in business and social

legislation. Key areas include pricing, antitrust, tariffs, regulation, labor.

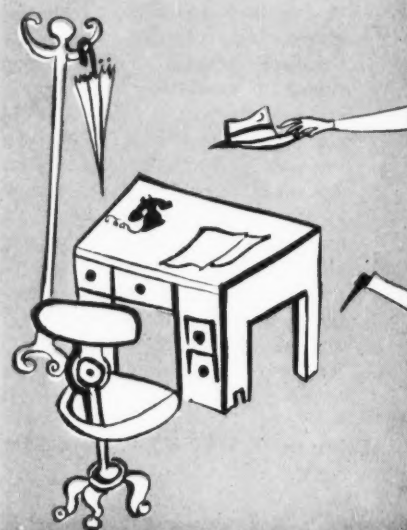
- Open statements of management's position, but without pressure on personnel.

- Moderate decentralization, so that local managements can meet local situations.

- Full-management participation from board chairman down, with the boss setting the example. Each person could work where his talents would be most useful — top management at organizing and fund-raising, lower echelons at doorbell-ringing and grass-roots campaigning.

In any case, companies now active in politics want others to join them. The chemical industry — a major contributor to an economy strongly influenced by political actions—has an obligation to air its views.

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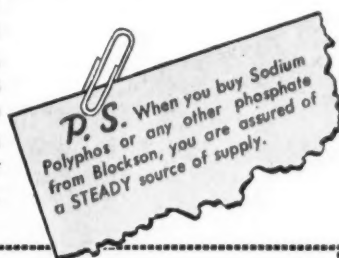
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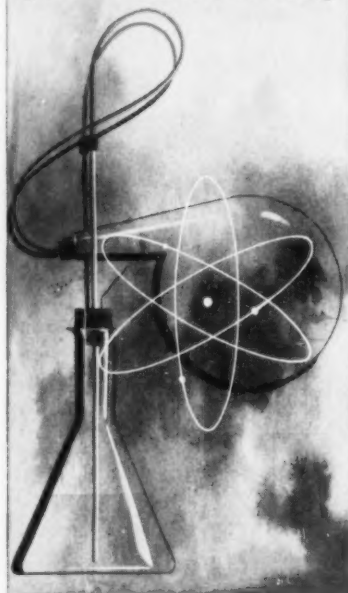
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ADMINISTRATION

Remaking an Image

Chicago-area chemical process industries executives last week joined forces in a determined bid for public acceptance. Behind the move: realization that the Chicago public's view of the CPI is badly distorted and steadily growing worse.

Speaking at the formal launching of a program designed to bring the public's view into focus, Stepan Chemical Co. President Al Stepan said that with the opening of the St. Lawrence Seaway, Chicago could develop into a major CPI center. But it would not, he said, "if we don't have the public on our side."

CPI concern stems from a recent Manufacturing Chemists' Assn. survey revealing that of the four major industry groups in the Chicago area—oil, steel, electronics and chemicals—the public's opinion of the CPI is the poorest, probably based primarily on pollution wrangles.

Committee Formed: To implement the program, a Chicago area drug and chemical industries activities committee was formed, with Stepan as '59 chairman. An annual fund of \$15,000-20,000 was set up to apply the techniques of Chemical Progress Week on a year-round basis.

LEGAL

Water Pollution Activity: In two key industrial states, legal maneuvering is under way that may significantly affect future antipollution developments.

• At Niagara Falls, N.Y., the director of public utilities, Vernon Packard, has been instructed to conduct a study to determine the cost to chemical process companies of neutralizing industrial waste dumped into the city's sewers. The study, requested by City Councilman Augustine Maloney, will cover all industries in Niagara Falls.

The move resulted from an earlier Maloney-sponsored report on ways to curb "wear" on the city's sewer system. That report, indicating that industrial waste made up almost 75% of the city's sewage flow, suggested a city-wide sewerage rental system.

Maloney objected to a rental system, proposed instead that the council consider requiring industries to neutralize waste "at the source" before

it's dumped into the sewers.

• And, at Olympia, Wash., a bill has been introduced in the state legislature that would create a state department of water resources to replace the department of conservation and development.

The bill is expected to face strong opposition, especially from Gov. Albert Rosellini—it would eliminate one of his major state departments.

The proposed agency apparently is designed to present a more unified approach to the problem of pollution, since it would also replace the state pollution control commission.

• **Mining Process Tax:** Mine operators who do some chemical processing may lose a tax advantage they won in the courts. In his recent budget message, President Eisenhower said the Treasury Dept. would recommend legislation to limit processes—by specifying them—that can be considered "mining" for purposes of computing percentage depletion on mineral products.

The legislation probably will cover such minerals as bauxite, borax and sulfur. The idea is to narrow the effect of some recent court decisions allowing application of percentage depletion to the full sales price of finished products. This includes some nonmining costs, such as processing or manufacturing steps, considered by the courts as treatment processes necessary to produce a marketable product.

LABOR

• **Southern Settlements:** Allied Chemical Corp. employees at Hopewell, Va., ended a one-week strike with acceptance of a proposal calling for a new two-year contract. Some 1,200 workers, represented by Local 12103, District 50, United Mine Workers, voted for a wage increase of 4¢/hour and for increasing call-in pay from double time to two-and-a-half times on paid holidays. Other changes were in the vacation plan, seniority structure, pension plan and similar benefits. The contract runs from Jan 12, '59 to Jan 11, '61.

• **Builders Simplify:** In Miami Beach, AFL-CIO's Building Trades Dept. declared it would use top-level pressure to crack down on wasteful labor prac-

tices stifling union opportunities in oil and chemical plant-building. Building union members have been losing out on jobs because archaic work rules are inflating contractors' costs—the latter then turn to nonunionized labor.

Merger Talk: Oil, Chemical & Atomic Workers President O. A. Knight has reported high optimism on recent merger talks between his union and International Chemical Workers Union. Says he: "I would say there is a strong possibility that merger can be accomplished at the October conventions." Both unions have scheduled October sessions in Cleveland in the event merger talks are fruitful. If not, OCAW will meet in Chicago.

KEY CHANGES

George B. Newman to president and chief executive officer, **Edmund S. Burke** to board chairman, Kelly-Springfield Tire Co. (Cumberland, Md.), wholly owned subsidiary of Goodyear Tire & Rubber Co.

Raymond D. Stevens to board chairman; **Arthur L. Stevens** to president; **Raymond D. Stevens, Jr.**, to executive vice-president; **Francis M. Jaffe** to vice-president, Industrial Division; **Herman J. Deney** to vice-president, research; **Darwin E. Ellis** to vice-president, production; **Pierce & Stevens Chemical Corp.** (Buffalo, N.Y.).

Hans Stauffer to director, Columbian Carbon Co. (New York).

Richard C. Cole to president, Vitro Uranium Co. Division (Salt Lake City, Utah); **Edward W. Upton** to executive vice-president, Refinery Engineering Co. Division (Tulsa, Okla.); **William B. Hall** to vice-president; all of Vitro Corp. of America (New York).

Owen Stoner to vice-president, Vick Chemical Co. (New York).

William W. Scull to vice-president, manufacturing; **Amory Houghton, Jr.**, to director; **B. F. Goodrich Co.** (New York).

DIED

Robert J. Hoffman, 71, retired vice-president, Union Carbide Corp., at New York.

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Estimated Retail Flatware Sales 1952-57
(million dollars)

	Sterling Flatware	Plated Flatware	Stainless Flatware
1952	\$107	\$89	\$22
1953	\$105	\$99	\$30
1954	\$95	\$96	\$33
1955	\$100	\$96	\$50
1956	\$100	\$90	\$66
1957	\$95	\$60	\$71

**Up \$49 million
from '52**

Stainless Dims Silver-Polish Sales Luster

This month in the U.S., some 110,000 brides will head down the wedding aisle. Most of them — about 60%, according to good estimates — will have acquired flatware sets during their engagement periods. Chances are too that the flatware will be stainless steel, rather than sterling or plated ware. Low cost, good styling and no-need-to-polish has skyrocketed (see chart) sales of stainless.

The big swing to stainless flatware would appear to be a strong threat to silver-polish makers — but they're surprisingly unconcerned. Very little polish is used on flatware, in any case, they maintain.

They claim that the market for silver polish — \$5 million/year now — is growing at a 2-4%/year clip. Reason for this growth, they say, is

that 70% of all silver polish sold is used to brighten up sterling and plated holloware (ornamental and serving pieces).

Although sterling and plated silver now have the bulk of the holloware market, stainless is beginning to pose a threat there, too. Item: In March, Wallace Silversmiths (Wallingford, Conn.) will introduce a stainless steel oven-to-table line, with matching flatware.

Any major swing toward stainless holloware would put a big dent in silver-polish sales. Polish makers are confident, however, that sterling silver sales will hold up (they're less sure about the future of plated ware) and they cite rising incomes, and the growing number of homeowners as market-bolstering factors.

Homeowners, they claim, have moved their status symbol from the garage back into the dining room.* And there's no better status symbol than sterling silver, according to one polish maker. He reports that women in the "recent middle class" are his best customers. "Sterling's a mark of success to these women; it's as important to them as their complexion. They'll buy the best polish available and use it daily," he says.

Here's a rundown of the more important silver polishes and cleaners, and estimates of where the market for these products is going:

Pastes and Liquids: By far the most popular silver polishes now are pastes and liquids (other forms: dips, chemi-

*An interesting note is the return in popularity of the separate dining room as opposed to the combination living-dining room.

SPECIALTIES

cally treated cloths, etc.). Pastes out-sell liquids at least five to one. Both types contain a mild abrasive (usually 10-20% diatomaceous earth). In addition, they may contain a bodying agent (e.g., carboxymethyl cellulose); a dispersing agent; a silicone, mineral oil or kerosene; ammonium carbonate or some similar alkaline material; glycerine; a preservative; an essential oil; a rust inhibitor; a dye; and water. Silver-polish formulas change little from year to year. Several products have been on the market over 50 years without formulation change.

Slipping Dips: The trend to silver dips (cleaners based on thiourea), which reached its peak in '53, has subsided. In '53, some 38 companies were turning out these products; sales volume may have exceeded that of pastes. But due to a raft of unfavorable publicity, plus inept sales promotion by some, sales of dip cleaners took a sharp drop.

Four companies now turn out these products on a large scale. They report that their products are once again moving across retail counters. One reports that sales have risen to within two-thirds of their '53 level.

Other products include polishing cloths and mitts (impregnated with jewelers' rouge, or ferric oxide), polishing paper (impregnated with an abrasive), electrolytic cleaners (pieces of magnesium alloys) and a few aerosol products. Biggest competition for the paste and liquid polishes are all-purpose metal cleaners. Instead of buying a special cleaner for brass, copper, chrome, aluminum, stainless steel and silver, many housewives get one cleaner for all.

Cleaner Makers: Because silver polish is a relatively easy product to manufacture and offers the chance of a high profit margin, it has been espoused by many one-man operations. Entrepreneurs have bought a bag of diatomaceous earth and a jug of peppermint oil, rented a hotel room, mixed the product in the bathtub, and have then gone out to peddle the polish door-to-door. Some have made as much as \$500 on a \$30 investment. For the most part, however, the one-man operator gets out of the business about as fast as he gets into it. Although silver polish is easy to make and offers a high profit, it takes heavy merchandising for solid sales success.

Shining Examples: In the silver-polish field J. A. Wright and Co. (Keene, N.H.) is the leader. Wright probably has 70-75% of the national silver-polish market. Other large companies in the field: The Gorham Mfg. Co. (Providence, R.I.); The International Silver Co. (Meriden, Conn.); R. T. French, Inc. (Rochester, N.Y.); Electro Silicon Sales Co. (Brooklyn, N.Y.); Reed and Barton, Silversmiths (Taunton, Mass.); J.N.T. Mfg. Co., Inc. (Pawling, N.Y.); Boyle-Midway Inc. (Cranford, N.J.) and Copper Brite, Inc. (Los Angeles). Wallace Silversmiths recently began market testing a new silver polish in Denver, plans to go national by April 1.

Leaders in the silver dip field are C. N. Coughlan Co. (West Orange, N.J.) and Lewal Industries, Inc. (New York).

Where They Shine: Most silver polishes are sold through drug, grocery and hardware distributors, although a few companies market directly to the larger department stores and grocery chains.

The bulk (85%) of silver polishes are sold through grocery stores and supermarkets. The remaining 15% is sold through drug, department, hardware and jewelry stores, probably in that order. Even though grocery outlets are by far the best for silver polishes, specialty makers have a hard time convincing grocers, to stock the item. Main reason: silver polish—compared with a detergent, for example—is a slow-moving item.

Users of silver polish buy at the most two packages a year. Average price: about 40¢ for an 8-oz. jar. Dip cleaners usually cost about \$1 for an 8-oz. jar.

Holiday Glitter: Silver-polish sales are seasonal. Prior to any holiday traditionally marked by a family dinner, there is a noticeable spurt in sales. Sales also pick up during the spring cleaning season.

Some marked geographic differences are apparent, too. The Eastern seaboard and the South are considered the best markets. New York, Massachusetts, Tennessee, Illinois, Indiana, Texas and California are considered the best individual states.

Grandmother's Word: Brandnames mean a lot in the silver-polish field. However, the brand of preference isn't necessarily the one that gets ad-

vertised; rather, it's likely to be the one that grandmother or mother used. When grandmother passes down the silver, she also passes down her particular brand of silver cleaner.

Institutional Users: Housewives buy the bulk (90%) of silver polishes; industrial users, the remaining 10%. Hospitals and the military are the largest institutional consumers. Generally, large hotels, chain restaurants, airlines, other establishments that use large quantities of flatware, don't polish flatware, use burnishing machines instead.

Other specialized users of silver polishes are silver and jewelry stores, museums and the electronics industry, where silver cleaners are used on small contact points.

Where Next: It's certain that makers of both stainless steel and sterling silver housewares can look forward to growing markets for their products. According to *Seventeen* magazine, there are now 8.5 million girls in the 13-19 age group—by '67 the number will have increased to 12.42 million. It's this teenage group that represents the biggest potential market for housewares, and for polishes needed to clean them.

From the Mouths of Babes: Today, teenage girls spend over \$4.2 billion a year. Flatware makers can count on getting a sizable chunk of this sum. Almost 1.6 million already own flatware—nearly 6 million plan to start collections within the next few years. Another survey, conducted by Ernest Dichter for the Sterling Silversmiths Guild of America, shows that 71% of teenage girls think it's important to own stainless flatware, 50% to own plated silver and 46% consider it important to own sterling.

Switch for Salvation: Polish makers are keeping a sharp eye on these housewives-to-be. They'll also watch for the introduction of no-tarnish silverware (it's on the way), which could knock the bottom from under their market.

If the sterling silver market does go into a serious decline, the silver-polish maker probably won't idly bemoan his fate. It's a good bet that he will develop—and promote, despite "no polish" claims—a stainless polish. It could add new luster to a tarnished sales picture.

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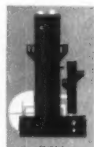


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SPECIALTIES

EXPANSION

S. C. Johnson: A \$4-million building program has been scheduled by S. C. Johnson & Son for the next two or three years. The program will begin with construction of a manufacturing plant at Waxdale, in Wisconsin's Racine County, where the company's warehouse and shipping center is situated. Research and development facilities at Racine will be expanded.

Pace Inc.: New and larger quarters have been acquired by Pace Inc., contract and aerosol packager. The company is moving to Building 1114, MacArthur Road, New Castle County Airport, Wilmington, Del. General offices and manufacturing and packing facilities will be consolidated.

Huisking: All the patents, processes, formulas and other material for the production of medicinal- and technical-grade synthetic camphor have been purchased from Du Pont by Chas. L. Huisking & Co. (417 Fifth Ave., New York).

Plastic Tube: Two companies have been set up in Nashua, N.H., by Henry Griffith, a former vice-president of Bradley Container Corp. The new outfits are Plastic Tube and Bottle Inc., which will manufacture polyethylene and PVC bottles. The other is its sales affiliate, Plastic Tube & Bottle Distributors Inc.

Rinshed-Mason: Controlling interest in Wolverine Finishes Corp. (Detroit) has been purchased by the Rinshed-Mason Co., also of Detroit.

United States Borax: New equipment to manufacture liquid weed-control materials for railroad use has been installed by Pacific Coast Borax Co. at Fort Worth, Tex. Operations will begin there in the spring. Similar new facilities, designed to serve railroads of the Northwest, have been established at Butte, Mont.

PRODUCTS

Dry-Mixture Pickler: A dry mixture formulated to pickle all base metals and to strip chromium has been introduced by Hanson-Van Winkle-Munning Co. (Matawan, N.J.) The

formula, tradenamed Pickelene 300, includes acid salts, activators, and surface-active agents. In aqueous solution, Pickelene 300 may be used as an activating acid dip prior to plating steel, brass, copper or zinc die castings or as remover of rust, heat-treat scale, etc. It strips chromium when used at 1 lb./300-gal. solution.

Liquid Aluminum: Devcon Corp. (Danvers, Mass.) is offering a liquid aluminum material that can be cast without heat or pressure. It's called Devcon F-2, consists of 80% aluminum, 20% epoxy putty. The material bonds aluminum, steel, bronze, wood or ceramic, or combination of these. It's available in 1-, 4- and 15-lb. kits.

Stops Trouble Topside: Westwood Pharmaceuticals (Buffalo, N.Y.) is offering a new "therapeutic" shampoo called Sebulex. The shampoo contains sulfur, salicylic acid, hexachlorophene and lanolin, in addition to anionic surface-active cleansers and wetting agents. It is packaged in a 4-oz. plastic bottle, is sold over-the-counter.

Lip Protector: The Stanback Co. (Salisbury, N. C.), maker of headache powders and tablets, has expanded into a new field. It has just begun marketing a product called Chap-Et, for treatment of chapped lips and fever blisters.

Low-Cost Paint Line: American-Marietta Co. (Chicago) is marketing a new line of inexpensive maintenance paints. The line, tradenamed Dura-wear, will be sold by A-M's Valdura Division. Paints are available in red, gray, black and two shades of green.

Short-Oil Alkyd: Hercules Powder is offering a new short-oil alkyd. Cellolyn 604, says it allows formulation of low-cost metal finishes based on chlorinated rubber. With it, the firm adds, finishes can be made that dry tack-free in 30 minutes.

Improved Finish: The U. S. Dept. of Agriculture has just developed a new finish for wash-and-wear cottons. It's called APO (tris- [1-aziridinyl] phosphine oxide) and is said to have some marked improvements over present wash-and-wear treatments. According to USDA, the APO-treated cottons are highly resistant to

ADVANTAGES

RCI PENTAERYTHRITOL OFFERS YOU

- 1. UNIFORM QUALITY**—negligible ash content assures light colored resins and truer reactivity... consistently high hydroxyl content results in dollar savings for you.
- 2. CONTROLLED PARTICLE SIZE**—a minimum of dusting eliminates loss during loading... rapid solubility prevents conglomeration and charring.
- 3. EASY HANDLING**—RCI PENTA 681 is a non-hygroscopic, free-flowing, granular material... stable in storage.
- 4. READY AVAILABILITY**—warehoused in many strategic locations... available with RCI PHTHALIC and/or MALEIC ANHYDRIDES in economical mixed shipments.

With RCI PENTAERYTHRITOL 681 (Technical Grade) you get all four of the above advantages so important to the manufacture of your alkyds, rosin esters, in situ varnishes, synthetic drying oils and tall oil core binder vehicles.

For full details write RCI for the new *Bulletin*—*Technical Pentaerythritol 681*.

February 7, 1959 • Chemical Week

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SPECIALTIES

discoloration from chlorine bleaches and demonstrate outstanding crease retention and wrinkle resistance. APO is also claimed to be more durable than present finishes and to impart some flame resistance to the fabric treated with it.

The finish is applied by dipping cotton fabric into a water solution of APO, and removing the excess by passing the fabric between pressure rollers.

Although the USDA-developed finish shows some improvements over present finishes, it has one big drawback—it's expensive. Currently, the bulk of tris-(1-aziridinyl) phosphine oxide is imported to the U.S. Only two U.S. companies are now making the material, and their production is limited.

Orange Peel Products: Specialty makers attending last week's meeting of the Southeastern Chemical Conference in Lakeland, Fla., heard plenty of new ideas for products based on orange peels.

For example, M. F. Taggart, director of research for O'Brien Paint Corp. (South Bend, Ind.), told the group that peel oil extracted from oranges can be used to kill dandruff and athlete's foot, as an antiknock agent in gasoline additives and as an essential oil in paints.

Donald Othmer, of Brooklyn Polytechnic Institute, came up with some pharmaceutical uses for orange peels. He said that hesperidin derived from orange peel has already found important drug uses—to treat blood circulation difficulties, hypertension, heart disorders, nuclear burns. It can also be used as an anticoagulant.

Cotton Bug Control: Union Carbide Chemicals Co.'s Sevin has just been okayed by the state of Louisiana for cotton-insect control this year. Sevin is suggested for control of boll weevil, bollworm, and pink bollworm when used 1-2 lbs./acre. At lower concentrations it is also recommended for thrips, cotton flea-hopper and cotton leafworm.

While Union Carbide is pushing Sevin for cotton weevil control, American Cyanamid Co. is discontinuing the sale of methyl parathion, another insecticide for controlling boll weevil. Instead of methyl parathion, malathion and ethyl parathion will receive marketing emphasis.

Tracers

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Market Development—Opportunity to join Spencer Chemical Company's expanding Plastics Market Development program in a position which will permit the use of sales and technical abilities. We are seeking men who have a chemical or engineering background, and preferably three to five years' experience with thermo-plastics. A working knowledge of polyethylene and nylon is desirable but not essential. A unique opportunity exists to work with a new thermo-plastic-polypropylene. Please send detailed resume to: W. H. Swope, Personnel Manager, Spencer Chemical Co., 610 Dwight Building, Kansas City 5, Mo.

Research Director. Position open in Los Angeles pharmaceutical laboratory for Research Chemist with Ph.D. in Organic Chemistry or Bio-Chemistry. Experience required in vitamin technology. Excellent salary and conditions. Laboratories well located near best residential areas in Metropolitan Los Angeles. Write, submitting resume of qualifications, to: Wm. T. Thompson c/o Wm. T. Thompson Co., 2727 Hyperion Ave., Los Angeles 27, California or 3028 Locust St., St. Louis 3, Missouri.

Career Executive (Pharmaceuticals - Vitamins) Smart, aggressive, well-established National Company seeks qualified man for Manager of Sales and Branch Operations (Los Angeles). Rounded experience in pharmaceuticals and vitamins and chemical education background required—minimum Bachelor's, but prefer Master's Degree. Excellent salary and conditions. Headquarters located near best residential areas in Metropolitan Los Angeles. Send resume of experience and qualifications to: Mr. Wm. T. Thompson, Wm. T. Thompson Company, 2727 Hyperion Avenue, Los Angeles 27, California.

Wanted: Chemist or Pharmacist experienced in Veterinary pharmaceutical production. Medium sized business, nationally established. P-9869, Chemical Week.

Assistant Sales Manager—We are seeking a man with broad experience in industrial sales and sales administration, preferably in the food or pharmaceutical industries, with college degree in chemistry, chemical engineering or food technology. Position is with a technical division of national food manufacturing company. Division headquarters are located in New England. Company provides an excellent program of insurance, retirement, and related benefits. This is an opportunity to join an expanding division with excellent growth potential for the person selected. All replies will be treated with the strictest confidence. P-9885, Chemical Week.

Technical Sales—Aerosols—This is a salaried position with the Country's largest private label aerosol manufacturer, having plants in New York and Chicago. Unusually interesting work in the Greater Metropolitan New York area. The man we want should have a good technical background, preferably chemical, and a successful sales record. We will train him in aerosol technology. Interviews can be arranged in New York. Submit a complete background resume to: G. Barr & Co., 3601 So. Racine Ave., Chicago 9, Ill.

Rubber Process Engineer. Capable of deriving compounds, and establishing specifications, for molding of transfer and compression molded products. Established company, New York area. P-9888, Chemical Week.

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Complete Line Of Corrosion Proof Materials and construction services including acid and alkali proof cements, brick, linings, coatings, plastic ventilation and process equipment. This is a major line and requires technically trained agents who can devote a substantial portion of their time selling to industry and architect engineers. Several protective territories available in East, South and Midwest. RW-9807, Chemical Week.

POSITION WANTED

Market or Sales Development position desired. B.S. in chemical engineering. Age 32. 8½ years experience with one company in fiber sales development, production supervision and research. Looking for opportunity. PW-9848, Chemical Week.

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Aries Associates, Inc.—Technical and Economic Consultants to the Chemical Industry. New Products & Processes. Technical & Economic Studies. Design and Initial Operation of Complete Plants. Process Analysis-Market Research, 77 South St., Stamford, Conn. DA 5-2536.

Clark Microanalytical Laboratory—CH. N. S. Halogen, Fluorine, Oxygen, Alkoxy, Alkoxide, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

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Organic Chemical Plant Facilities Available. Have excess plant capacity available for distillation processing of organic chemicals. Can be operated on a custom or joint venture basis. Well suited for market development, experimental or commercial production. Other suggested uses: by-product upgrading or waste solvent reclaiming. Will consider licensing suitable processes. Located in the heart of the Los Angeles industrial area. Replies confidential. CWW-9890, Chemical Week.

FOR SALE

Free Catalog! Fort Pitt Brewery, Pittsburgh - 16-page, 2-color illustrated catalog showing all the processing equipment in this plant, which ceased operations in November. Thousands of dollars worth of equipment being sold piecemeal for a mere fraction for immediate delivery. Write to: Chas. S. Jacobowitz Corp., 3082 Main St., Buffalo 14, N.Y. Phone: AMherst 2100.

Kettle, 1-3000 gal SS. Syn. Resin comp. with Trent elect. jacket, cond. controls etc. FS-9816, Chemical Week.

Pilot Unit, SS., 30 gal. comp. package, elect. heated. FS-9820, Chemical Week.

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Pfandler 300 gal. blue glass-lined reactor, agit. & drive, Perry Equipment Corp., 1415 N. 6th St. Phila. 22, Pa.

Stainless Steel Spray Dryer, Turbulaire type N-2EBC, Size #425E, electric heating. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

Stainless Feeder—Klein #4 stainless steel en- closed feeder, AC motor and drive, like new, located West Coast. FS-9791, Chemical Week.

Tanks—Storage, 6-5,000, 13-12,000 gal. coiled Horiz., Steel. 4-27,000 gal. Vert., Solvent. FS-9831, Chemical Week.

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Tank Trailers for Chemicals Stainless Steel— new and used. Hackett Tank Co., Inc. P.O. Box 803, Packers Sta., Kansas City, Kas. MA 1-2363.

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Wanted For Rent Or Buy jacketed 350-750 gallon SS. or glasslined also 400-850 gallon slurry tank and tray oven. Write P.O. Box 182 Leominster (Mass.)

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'59 PRICE INDEX



FEBRUARY 7, 1959

WEEKLY BUSINESS INDICATORS

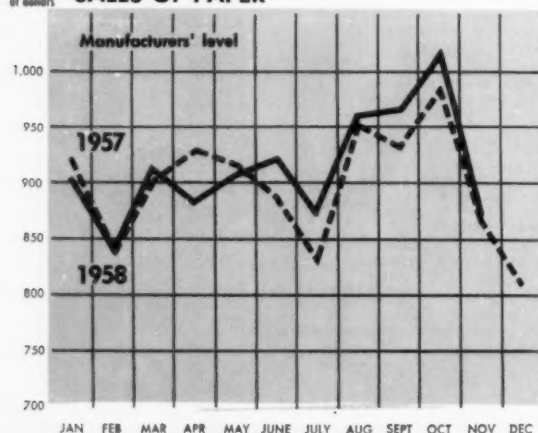
	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	194.5	193.0	185.0
Chemical Week wholesale price index (1947=100)	111.0	110.5	110.9
Stock price index (11 firms, Standard & Poor's)	49.36	50.12	40.97
Steel ingot output (thousand tons)	2,212	2,056	1,459
Electric power (million kilowatt-hours)	13,394	13,324	12,399
Crude oil and condensate (daily av., thousand bbls.)	7,194	7,087	6,923

MONTHLY INDICATORS—Employment

	Latest Month	Preceding Month	Year Ago
All manufacturing	11,908	11,960	12,449
Nondurable goods	5,180	5,239	5,296
Chemicals and allied products	515.7	516.3	532.8
Paper and allied products	442.7	445.5	454.8
Rubber products	196.7	195.6	207.7
Petroleum and coal products	156.0	156.7	163.1

millions of dollars

SALES OF PAPER



millions of dollars

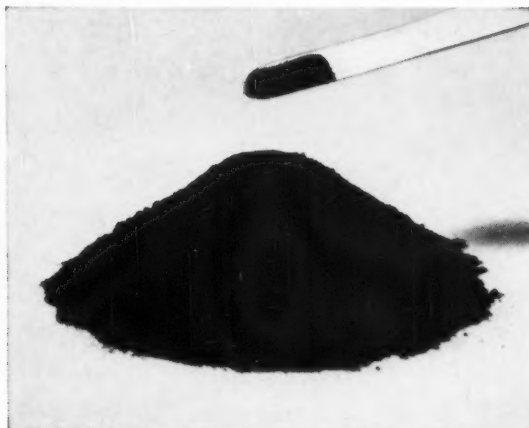
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Ammonium acetate, crystal, purified, $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$. These are small, slightly moist, colorless to white crystals. They are very soluble in cold water and alcohol. Uses of this exceptionally pure, high quality product include the manufacture of foam rubber and vinyl plastic, the dyeing of fabrics, and applications in explosives and pharmaceuticals.



Cupric acetate, crystal, reagent and technical grades, $\text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot \text{H}_2\text{O}$. B & A cupric acetate is of highest quality and purity... also easy to handle. Reagent grade is used in the manufacture of synthetic fibers... technical grade in the manufacture of dyes, copper mirrors and printed circuits.



Calcium acetate, powder, purified, $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot \text{H}_2\text{O}$. This is a high quality, white, free-flowing powder made from carefully selected raw materials. It should not be confused with ordinary gray acetate of lime, over which it offers many advantages. Its uses include the liming of resins, catalyst in preparation of metal resins, and varied applications in pharmaceuticals and foods. It is also used in the petroleum industry for the preparation of calcium soaps.



Potassium acetate, N.F. and technical, $\text{KC}_2\text{H}_3\text{O}_2$. B & A potassium acetate may be used as a humectant in various industries, such as textiles and cigarette paper manufacture. It has varied uses in the pharmaceutical industry.

For further information on any of these or other acetates—or any application ideas you may have—just drop us a line on your company letterhead asking for technical data or samples. If you'd like technical assistance, we'll be glad to work with you.

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